# Bicycle and Pedestrian Gap Study

April 2015

# Table of Contents

# Table of Contents (Cont.)



# Tables

# Graphs

# Figures

# Appendices

| | |
|---|---|
| **Appendix A** | **High Resolution Districtwide Maps** |
| **Appendix B** | **Alachua Countywide Bicycle Master Plan** |
| **Appendix C** | **First Coast Greenways & Trails Master Plan** |
| **Appendix D** | **Technical Reference for Level of Service** |
| **Appendix E1** | **FDOT Complete Street – September 17, 2014** |
| **Appendix E2** | **FDOT Roadway Design Bulletin 14-17** |
| **Appendix E3** | **FDOT Lane Elimination Guidance** |

# 01
# Executive Summary

# 1.0 Executive Summary

The provision of safe and connected bicycle and pedestrian travel ways is a priority for the Florida Department of Transportation (FDOT). As one of the largest of seven Districts within the FDOT, District Two is proactively taking the initiative to provide a framework to ensure that safe and connected bicycle and pedestrian travel ways are assessed, planned, and provided throughout the District. District Two Planning has undertaken this bicycle and pedestrian gap study to determine the locations of gaps in the interconnectivity of the bicycle and pedestrian facilities throughout the District. FDOT District Two Traffic Operations was influential in developing the gap prioritization methodology, and this study acknowledges their contribution in creating the criteria and providing assistance.

By assessing the accommodation provided by existing roadways and determining the demand for future facilities, the District's goal is to plan, fund, and build bicycle and pedestrian infrastructure. This approach includes retrofitting existing infrastructure and adding bicycle and pedestrian facilities to new transportation infrastructure. This gap study, which is expected to be updated on a regular basis as determined by the District, will provide the information the District Planning staff needs to meet the goal of providing a connected bike and pedestrian infrastructure.

Within the past 15 years, several regional and local agencies within District Two have developed bicycle and/or pedestrian plans. This Districtwide gap study is not intended to replace any adopted regional, county, or municipal bicycle and/or pedestrian plans. The study is intended to facilitate intergovernmental coordination with all transportation agencies in the District and to provide consistency for the planning of bicycle and pedestrian facilities within the District. This gap analysis provides the big picture for connectivity throughout the District and will help local agencies when considering linkages to the state roadway system. The FDOT District Bike and Pedestrian Coordinator will utilize this information to advise District staff and consultants on improvements and applicable technical standards in order to insure that bike and pedestrian facilities are effectively designed in accordance with FDOT policy and Americans with Disabilities Act/Section 504 of the Rehabilitation Act of 1973.

The gap study is divided into sections and subsections. **Sections One** and **Two** are the Executive Summary and the Introduction to the study, respectively. **Section Two** discusses the history of bicycle and pedestrian policy from federal and state perspectives. The FDOT has made bicycle and pedestrian travel an integral part of the transportation system through its *Complete Streets Policy* and bicycle and pedestrian design standards for the state highway system.

**Section Three** of the study, Existing Conditions, details the existing bicycle and pedestrian network throughout District Two. This section includes a summary of the non-motorized transportation plans created by other planning entities. The existing conditions detailed in this section reflect the various bicycle and pedestrian facility types within the District using the FDOT Roadway Characteristics Inventory (RCI) database. The mapping portion of this section includes detail maps of these existing facilities. Also included is a table with the number of miles for each category of bike and pedestrian facilities by county. Note that the static map series represent facility conditions at the current time, the RCI database is being updated on a regular basis as facility conditions change and the associated data is available. For latest facility information, visit online interactive mapping system at http://www.dot.state.fl.us/rddesign/BikeRouteViewer/index.html.

**Section Four** of the study, Level of Service Analysis, provides details on how the bicycle and pedestrian level of service (LOS) was determined for the state roadway system within District Two, and maps the current LOS for each segment of the network. The bicycle and pedestrian LOS model methodologies are detailed in the study and were utilized to determine the quality of bicycling and walking accommodation based on a variety of traffic and roadway design factors that were analyzed. It assesses the current supply of bicycle and pedestrian facilities from the Existing Conditions.

The current and future potential demand for bicycling and walking are presented in **Section Five**. The methodology for determining a demand score is detailed in this section along with maps that show the demand score by section in each county. The potential demand analysis identified and quantified the potential bicycle and pedestrian trip activity for existing and future conditions.

The crash and safety analysis in **Section Six** includes a review of historical bicycle and pedestrian crash data in District Two. From the crash data, temporal and spatial trends were identified based on factors such as the lighting condition, day of week, and side of roadway, among others. The crash and safety analysis includes crash clusters, which revealed areas where there were larger concentrations of crashes. Maps of bike and pedestrian crash locations and crash cluster locations are included in this section of the Study.

**Section Seven**, Gap Prioritization, utilizes analysis from the previous study sections to provide each bicycle and pedestrian gap, as identified in Section Three, with a prioritization score. Several factors were included in the analysis and determination of the network gaps and their accompanying prioritization score. The gaps were identified and prioritized based on the LOS analysis (Section Four), potential demand for bicycling and walking (Section Five), and crash data analysis (Section Six). Contiguous gap segments were consolidated by calculating the distance-weighted average of the component segment priority scores for both the bicycle mode and the pedestrian mode. All bicycle and pedestrian links were grouped into tiers of ranking priority.

The results of this prioritization process can serve as a guide to the District as it seeks to improve bicycle and pedestrian accommodations over time. While gradual expansion of the non-motorized facility networks will be accomplished through a variety of funding sources and project types, these findings can provide an objective resource for future roadway, pedestrian, and bicycle planning efforts.

At the end of each section are maps that graphically display the information from each section for each county in District Two. **Appendix A**, delivered electronically with this report, provides each analysis layer on a high resolution map of the District. The high resolution maps can be utilized for viewing details within each analysis layer. **Appendices B** and **C** include bike and pedestrian plans produced by other planning entities in District Two. **Appendix D** includes technical information about the level of service models utilized for the study and **Appendices E1** through **E3** include FDOT guidance and direction relative to bike and pedestrian facility design.

# 02
# Introduction

# 2.0 Introduction

Starting in the 1950s and continuing into the beginning of the 21st century, the United States has built the interstate highway system and thousands of miles of connecting arterials to create an interconnected roadway system that has been the envy of the world. During this period, bicycle and pedestrian planning and supporting infrastructure held a low priority when competing for funding. Today, there is an increased interest in planning, funding, and building of bicycle and pedestrian infrastructure. This has included retrofitting existing infrastructure and adding bicycle and pedestrian facilities to new transportation infrastructure.

During the 1990s, policy shifted from regularly adding more capacity to the roadway system by adding automobile lanes to offering the user choices in selecting from several modes of transportation. By enhancing mode choice selection, benefits are realized in improved air quality, cost savings, reduced congestion, and the promotion of healthy life choices. Supporting policies have been created at the federal level and continue through to the local level. In 2010, the FHWA (Federal Highway Administration) issued its policy, *United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations*, which included its policy statement as shown to the right.

> *The Department of Transportation (DOT) policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide — including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.*

Recommendations associated with this policy include the following:

- The consideration of walking and bicycling as equals with other transportation modes
- Ensuring that there are transportation choices for people of all ages and abilities, especially children

In 2010, the State of Florida established a statewide initiative on bicycle and pedestrian mobility. The state has established an advisory council, guidance and design policies, and support via bicycle and pedestrian coordinators in each Florida Department of Transportation (FDOT) District.

First, the FDOT issued a *Complete Streets Policy* on September 17, 2014 (see **Appendix E1**). This policy authorizes the FDOT to routinely plan, design, construct, reconstruct and operate a context-sensitive system of 'Complete Streets' that serve the needs of bicyclists and pedestrians, among other users. The recommendations contained in this study support the policy by stating that the FDOT will coordinate with various agencies and groups to provide complete streets on the state highway system.

Second, following the issuance of the *Complete Streets Policy*, the Department issued *Roadway Design Bulletin 14-17* (see **Appendix E2**) in November 2014 regarding urban arterial lane widths and bicycle lane options. Citing the American Association of State Highway and Transportation Officials' (AASHTO) guidance, the bulletin modifies the FDOT *Plans Preparation Manual* (PPM) by establishing 11-foot lane widths as the standard for divided urban arterial and collector state roadways with design speeds of 45 miles per hour or less. Furthermore, it establishes 7-foot buffered bicycle lanes as the standard bicycle facility for new construction and roadway reconstruction on all state roads in or within one mile of an urban area, as well as, on curb and gutter roadways in all other areas. In addition to providing a framework for improved bicycle accommodation on new roadways, the preponderance of existing lane widths greater than 11 feet create many opportunities to narrow lanes and use the resulting space for bicycle lanes. While this report does not identify lane widths, it is a factor to consider in scoping and plan development for the design team and the District Bicycle/Pedestrian/American with Disabilities Act Coordinator.

In addition to narrowing lanes, another emerging technique to create space for bicycle and pedestrian facilities is by implementing lane eliminations, also known as “road diets.” In response to increased lane elimination requests on state roadways, the Department prepared the *Statewide Lane Elimination Guidance* in February 2014 (see **Appendix E3**). The primary purpose of this guidance is to provide an example process for reviewing applications for lane eliminations including meetings, methodologies, and review protocols. It describes twenty common issues (safety, traffic operations, impacts to transit, etc.) associated with lane elimination projects, citing research to summarize impacts and related factors to consider. This document provides useful guidance for potential cases in which lane eliminations may be used to eliminate some of the bicycle and pedestrian gaps identified in this study.

Further direction was codified in 2012 when Congress passed the *Moving Ahead for Progress in the 21st Century* (MAP-21) transportation bill. Beginning in October 2012, the Safe Routes to Schools (SRTS) Program became eligible to compete for funding alongside other programs, including the Transportation Enhancements Program and Recreational Trails Program, as part of a program called Transportation Alternatives Program (TAP).

## 2.1 Purpose

With the emphasis on integrating safe bike and pedestrian facilities into the state’s transportation network, District Two has undertaken this study to determine the location of gaps in the interconnectivity of the bike and pedestrian facilities throughout the District. Bicycle and pedestrian gap analysis is utilized to map those gaps in the interconnectivity of the bicycle and pedestrian network, thereby identifying opportunities to improve the network and make connections throughout the system. A safe and continuous bicycle and pedestrian network is an important part of any multimodal transportation system. The study is a guide for future planning of bicycle and pedestrian facilities in District Two. It details the existing locations of bicycle and pedestrian facilities, the level of service (LOS) for bike and pedestrian travel on all state roads (the study’s evaluation network), the current and future demand for bicycle and pedestrian facilities, bicycle and pedestrian crash location and analysis, and gaps in the current bicycle and pedestrian network. The results of the component analyses are used to create priorities among the identified gaps.

It is envisioned that the study will be utilized by planners looking to enhance the bicycle and pedestrian network or for information on the status of state roads in relation to available bicycle and pedestrian facilities. The *Uniform Minimum Standards for Design, Construction and Maintenance for Roadways*, also known as the Florida Greenbook, states that all new roadways and major corridor improvements, except limited access, should be designed and constructed with the assumption that bicyclists will utilize them.

The Florida Greenbook further states that sidewalks should be constructed in conjunction with new construction and major reconstruction in urban areas.

The study is intended to facilitate intergovernmental coordination with all transportation agencies in the District and to provide consistency for the planning of bicycle and pedestrian facilities within the District. This gap analysis provides the big picture for connectivity throughout the District and should help local agencies when considering linkages to the state roadway system. While the study does not evaluate trails and other shared use paths that are not alongside state roads, providing on-road connections to these facilities is an important consideration.

This format is provided in sections by analysis which includes text and maps for each county in the District. The county maps contained in the report are for general reference purpose, and **Appendix A**, delivered electronically with this report, provides each analysis layer on a high resolution map of the District. The high resolution maps can be utilized for determination of details within each analysis layer.

# 03

# Existing Conditions

# 3.0 Existing Conditions

Within the past 15 years, several regional and local agencies within District Two have developed bicycle and/or pedestrian plans. The two primary facility-based plans that align with this districtwide gap study are the North Florida Transportation Planning Organization (NFTPO) 2006 *First Coast Regional Greenways & Trails Plan* and the Gainesville Urbanized Area Metropolitan Transportation Planning Organization (Gainesville MTPO) 2001 *Alachua Countywide Bicycle Master Plan*. This section describes these plans and several related initiatives. **Appendices B** and **C**, included with this study, contain complete versions of the studies referenced. This districtwide gap study is not intended to replace any adopted regional, county, or municipal bicycle and/or pedestrian plans. This report is not intended to solidify policy for FDOT. This report is a reference document used to identify those areas where bicycle and pedestrian infrastructure could be added.

Moreover, the gap prioritization analysis does not include projects funded or under construction, e.g., U.S. 301 between Baldwin and Callahan, that may alleviate existing gaps. The gap prioritization analysis only considers on-the-ground facilities. Specific gaps can be removed in future updates.

## 3.1 Summary of Non-Motorized Transportation Plans

### 3.1.1 First Coast Regional Greenways & Trails Plan

The *First Coast Regional Greenways & Trails Plan* prioritized nearly 300 bicycle, pedestrian, and off-road trail projects within the NFTPO's planning area. Through a series of workshops, the public identified the evaluated projects. Prioritization criteria consisted of the following:

- Proximity to parks
- Proximity to schools
- Proximity to transit routes
- Encumbrances (availability of public lands)
- Connectivity to the off-street greenways network
- Residential density of the surrounding area
- Classification as a regional greenway

All identified projects were ranked, and nine of the highest priority corridors were the subject of detailed corridor evaluations. **Table 1** shows the nine highest priority corridors, ranked in order of highest to lowest.

**Table 1: Detailed Corridor Evaluation Priority Rankings**

| County | Roadway | Segment |
|---|---|---|
| St. Johns | S.R. A1A | Vilano Bridge to Mickler's Landing |
| Clay | U.S. 17 | Green Cove Springs to Black Creek Trail |
| Duval | Commonwealth Avenue, McDuff Avenue, Forest Street | Downtown Jacksonville to Jax-Baldwin Trail |
| St. Johns | S.R. A1A | St. Augustine Beach to Vilano Bridge |
| St. Johns | S.R. A1A | Mickler's Landing to Duval County Line |
| Nassau | S.R. A1A | Amelia City to Fort Clinch State Park |
| St. Johns | S.R. A1A | State Road 206 to St. Augustine Beach |
| Nassau | S.R. A1A | Nassau/Duval County Line to Amelia City |
| Duval | S.R. A1A | St. Johns County Line to Mayport |

These field-based detailed corridor evaluations include existing conditions evaluations, right-of-way constraints, preliminary facility type identification, and traffic control needs. The plan also includes goals, objectives, and available funding sources for implementation.

In 2013, the NFTPO adopted its *Bicycle and Pedestrian Plan*. Unlike the *Regional Greenways & Trails Plan*, this plan is more policy-driven. It establishes an extensive series of goals and objectives and includes recommendations to the member jurisdictions' land development codes. It also incorporates a public survey completed by more than 2,000 residents that focused on demographics, bicycling and walking behaviors, and barriers to non-motorized transportation in the region. The survey results indicate opportunities for improved bicycle and pedestrian accommodation, which were used to identify subareas for future detailed evaluation (two such subarea studies are now underway, one for the Duval County beaches and one for the Riverside and San Marco neighborhoods near downtown Jacksonville).

The NFTPO funded the *Bicycle Plan for St. Augustine* in 2011, which focused on identifying and evaluating a dozen connected bicycle routes within the City of St. Augustine. The plan also includes a crash analysis and wayfinding signage protocol.

Many of the municipalities within the NFTPO planning region have independently developed and maintained bicycle and pedestrian facility inventories and maps.

### 3.1.2 Alachua Countywide Bicycle Master Plan

The *Alachua Countywide Bicycle Master Plan* prioritizes bicycle facility improvements for the county's arterial and collector roadway network. Similar to this districtwide gap study (but only for the bicycle mode), the Alachua County plan includes a level of service analysis and a latent demand analysis to identify and evaluate gaps in the bicycle network. The results of these analyses are combined with public input and construction costs to create a benefit-cost index for candidate facility improvements. The plan includes a crash analysis (not part of the prioritization process), enforcement and education recommendations, and funding opportunities.

A 2004 addendum to the Alachua County plan establishes a concept of nets (neighborhood connectivity), braids (local connectivity), and loops (rural connectivity), and makes policy and design recommendations.

## 3.2 Existing Conditions Mapping

For any assessment of bicycle and pedestrian facilities, a snapshot of the existing conditions is necessary. **Figures A1-1** through **A1-18** detail the existing bicycle facilities, and **Figures A2-1** through **A2-18** detail the existing pedestrian facilities districtwide by county for the 18 counties within District Two. The existing facilities were mapped using the following sources:

- Base roadway network – Navteq network and FDOT Transportation Statistics Office
- Bicycle and pedestrian facilities – FDOT Roadway Characteristics Inventory (RCI), September 2014 and December 2014

The data were reviewed for accuracy and compared with other sources. Most of the other sources available originated with the same referenced data sources as listed above.

### 3.2.1 Bicycle Facilities

There is an extensive network of bicycle facilities throughout District Two when paved shoulders are included in the analysis. Because of the design standards in the state of Florida for rural roads with paved shoulders, most of the rural roadways in District Two have a paved shoulder that can be utilized by a bicycle. This extensive network provides a connected system of paved shoulders for bicycle travel. However, Bradford, Dixie, Clay, Lafayette, Madison, Putnam, and Suwannee Counties appear to have major connection breaks in the paved shoulder network of bicycle facilities. These breaks are located in commercial areas where the rural road becomes a curb and gutter section and the paved shoulder disappears. In many of the areas, sidewalks are included in the curb and gutter sections. However, sidewalks are not generally considered as appropriate bicycle facilities.

In the urban areas of Alachua, Duval, and St. Johns Counties there are more designated bike lanes. Many of these are long connections and connect to a paved shoulder toward rural areas. The existing facilities show a need for more connections between designated bike lanes in the urban areas.

To be considered a shared use path within RCI, the following criteria must be met:

- Minimum of eight feet wide
- Exhibit appropriate traffic control at intersections
- Be a minimum of five feet from the edge of the roadway
- Be within the apparent right-of-way of the roadway

## 3.2.2 Pedestrian Facilities

For the purposes of this study, a pedestrian facility is defined as a sidewalk on at least one side of the street[1]. As detailed in the maps presented as **Figures A2-1** through **A2-18**, most pedestrian facilities are concentrated in the urban areas. The rural characteristics of many counties in District Two equate to sparse pedestrian facilities outside the small commercial centers. Baker, Bradford, Dixie, Gilchrist, Hamilton, Lafayette, Levy, Madison, Putnam, Suwannee, Taylor, and Union Counties have limited pedestrian facilities due to their rural nature. Nassau and Columbia Counties are mostly rural but have limited pedestrian facilities that provide some network connections. The urban counties of Alachua, Duval, and St. Johns have extensive pedestrian facilities with longer connections. Clay County, while urban and rural, does have some connections on major connecting roads to Duval County; however, the county lacks connectivity between many pedestrian facilities.

**Table 2** summarizes the bicycle and pedestrian facilities on state roads. Shared use paths exist on 56 out of 2,551 roadway miles (2.19 percent). Although it may lack connectivity between many pedestrian facilities, Clay County has invested in many shared use paths.

Bike lanes, which are more common than shared use paths, are present on 242 out of 2,551 roadway miles (9.48 percent). Alachua County has the most bike lanes in the District with 67 miles. With over 50 miles of bike lanes each, St. Johns and Duval Counties also ranked highly. When comparing the amount of bike lanes to roadway miles by county, St. Johns County ranks the highest because 30 percent of its state roads have bike lanes compared to 23 percent in Alachua County. Nassau County also fared well with 19 percent of its state roads having bike lanes.

The District has more sidewalks than shared use paths and bike lanes combined. Sidewalks occur on 575 out of 2,551 roadway miles (22.53 percent). They are most prevalent in the urban counties, i.e., Duval, Alachua, St. Johns, Clay, and Nassau Counties. Duval County has the most sidewalks in terms of amount (203 miles) and relative to its state roadway miles (42.68 percent).

According to 2011 Florida Greenbook, a paved shoulder with a 4-foot minimum width can be considered a bicycle facility. Using this criterion, Alachua County has the most paved shoulders in the District with 221 miles. Duval County ranks second with 208 miles. Other counties with high amounts of paved shoulders are Levy, St. Johns, and Columbia Counties. When comparing the amount of paved shoulders to roadway miles by county, Lafayette County ranks the highest because 99 percent of its state roads have paved shoulders. Overall, 71 percent of the District's state roadways have 4-foot minimum paved shoulders.

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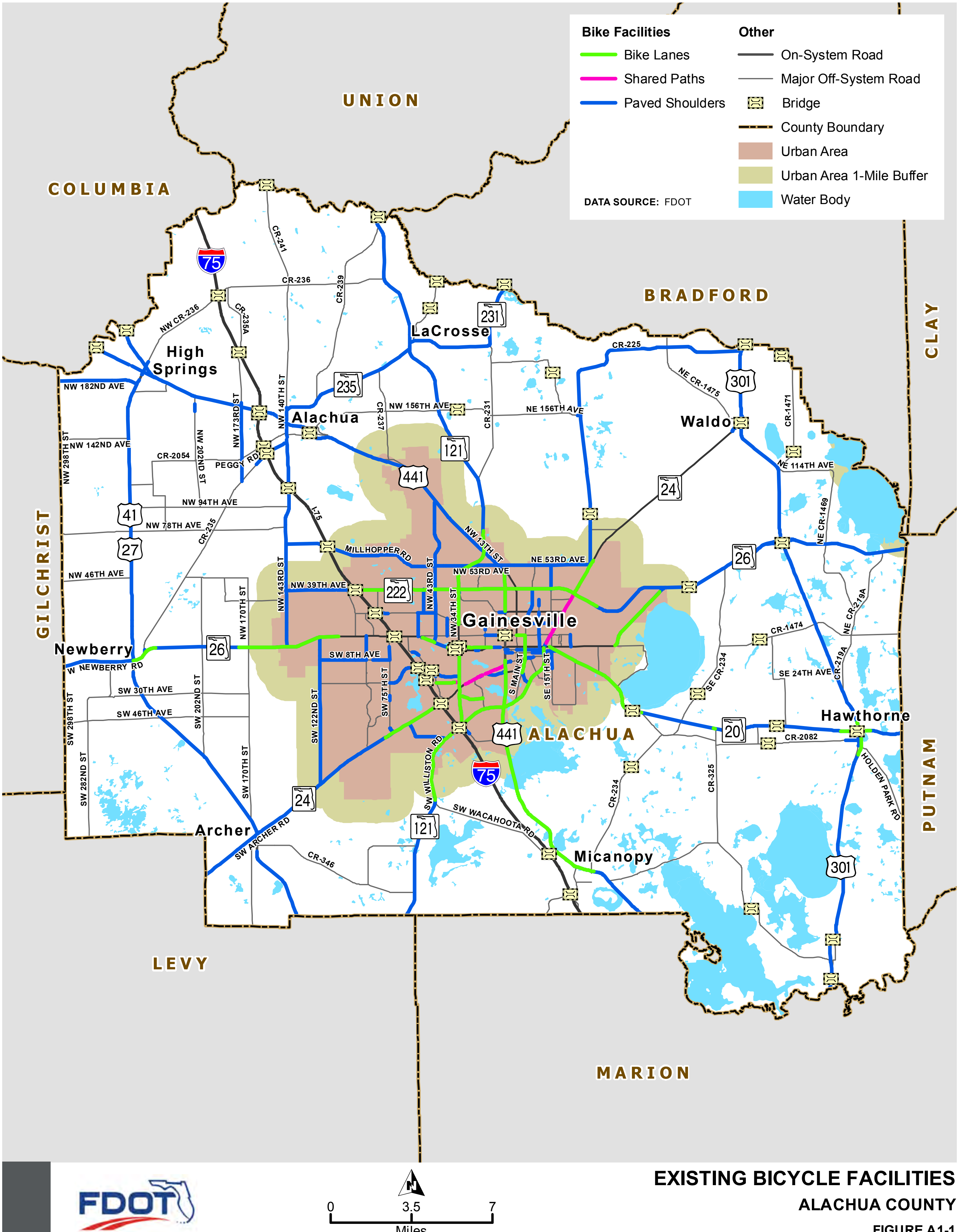
[1] In urban and some suburban areas, particularly in areas served by public transit, the District and other transportation agencies may ultimately strive for sidewalk coverage on both sides.

Table 2: District Two Bicycle and Pedestrian Facilities on State Roads

| County | Roadway (Miles) | Shared Use Path | | Bike Lane | | Sidewalk | | Paved Shoulders | |
|---|---|---|---|---|---|---|---|---|---|
| | | Miles | Percent | Miles | Percent | Miles | Percent | Miles | Percent |
| Alachua | 295.19 | 6.36 | 2.15% | 67.46 | 22.85% | 94.28 | 31.94% | 221.02 | 74.88% |
| Baker | 83.78 | - | - | 3.70 | 4.41% | 10.26 | 12.25% | 40.73 | 48.61% |
| Bradford | 69.05 | - | - | - | - | 11.02 | 15.96% | 56.25 | 81.46% |
| Clay | 109.84 | 15.36 | 13.99% | 10.18 | 9.27% | 41.31 | 37.61% | 92.83 | 84.52% |
| Columbia | 203.16 | 5.15 | 2.53% | 4.11 | 2.03% | 24.75 | 12.18% | 136.78 | 67.33% |
| Dixie | 46.28 | - | - | - | - | 2.59 | 5.61% | 44.23 | 95.57% |
| Duval | 476.54 | - | - | 52.64 | 11.05% | 203.40 | 42.68% | 207.64 | 43.57% |
| Gilchrist | 60.19 | 5.58 | 9.27% | - | - | 5.23 | 8.69% | 59.05 | 98.09% |
| Hamilton | 90.03 | - | - | - | - | 4.70 | 5.22% | 61.14 | 67.91% |
| Lafayette | 62.22 | - | - | - | - | 1.87 | 3.00% | 61.62 | 99.04% |
| Levy | 182.49 | - | - | 5.56 | 3.05% | 13.73 | 7.52% | 149.64 | 82.00% |
| Madison | 138.12 | 8.49 | 6.15% | 0.66 | 0.47% | 5.61 | 4.06% | 81.72 | 59.17% |
| Nassau | 111.61 | - | - | 21.56 | 19.32% | 40.11 | 35.94% | 78.08 | 69.96% |
| Putnam | 140.62 | 2.70 | 1.92% | 19.63 | 13.96% | 23.28 | 16.55% | 120.76 | 85.88% |
| St. Johns | 185.55 | 0.63 | 0.34% | 56.41 | 30.40% | 62.38 | 33.62% | 141.57 | 76.30% |
| Suwannee | 128.87 | 11.68 | 9.06% | - | - | 17.93 | 13.91% | 97.37 | 75.55% |
| Taylor | 110.19 | - | - | - | - | 6.51 | 5.91% | 99.55 | 90.34% |
| Union | 57.58 | - | - | - | - | 5.83 | 10.12% | 53.98 | 93.75% |
| **Total** | **2,551.32** | **55.95** | **2.19%** | **241.91** | **9.48%** | **574.78** | **22.53%** | **1,803.95** | **70.71%** |

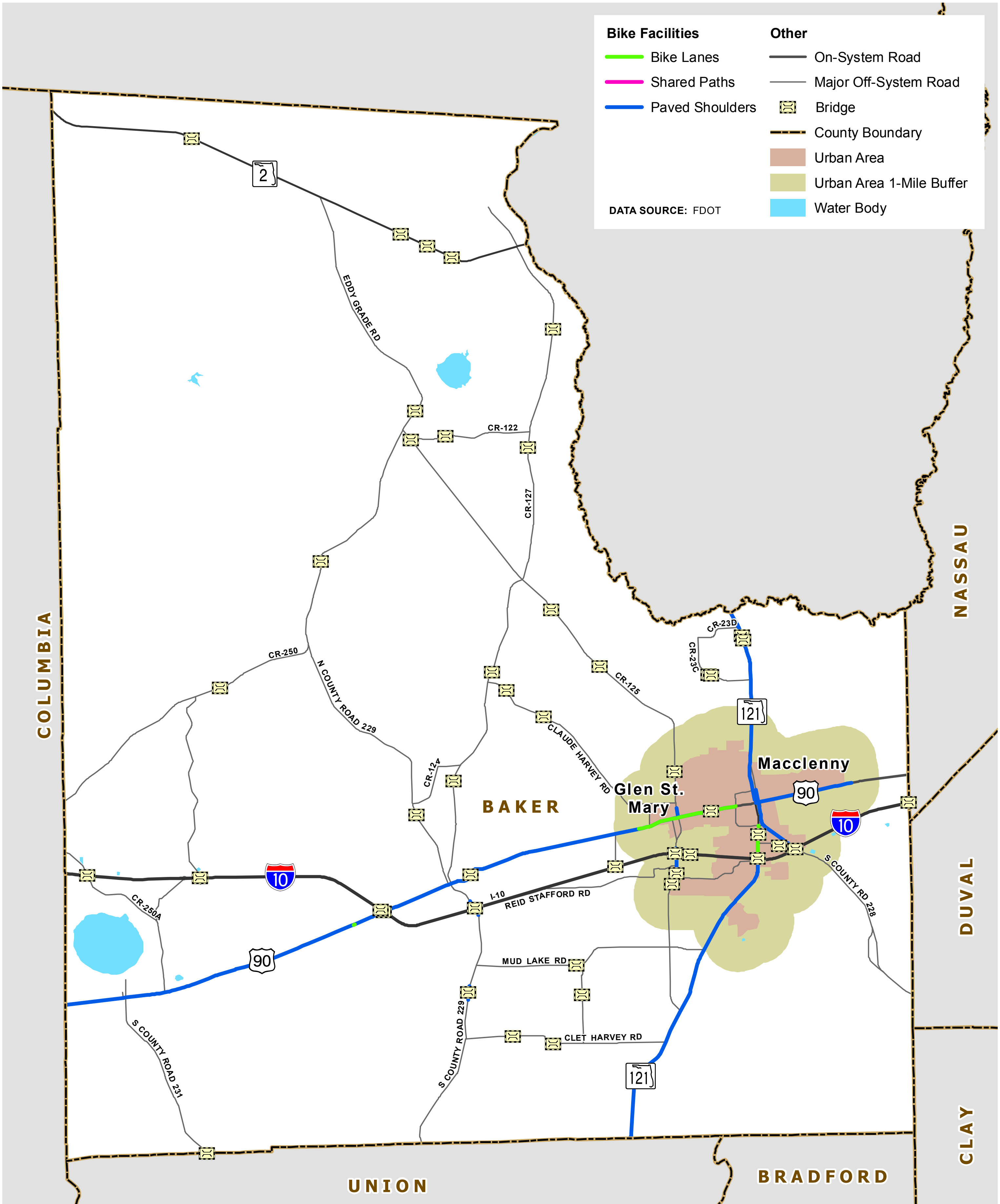
Note: The bicycle and pedestrian facilities were identified using the RCI database. The sum of individual elements on each row will not add up to the value of roadway miles for each county because each facility is a distinct type and the county totals do include limited access facilities. The roadway miles include roads without bicycle and pedestrian facilities.




# EXISTING BICYCLE FACILITIES

## ALACHUA COUNTY

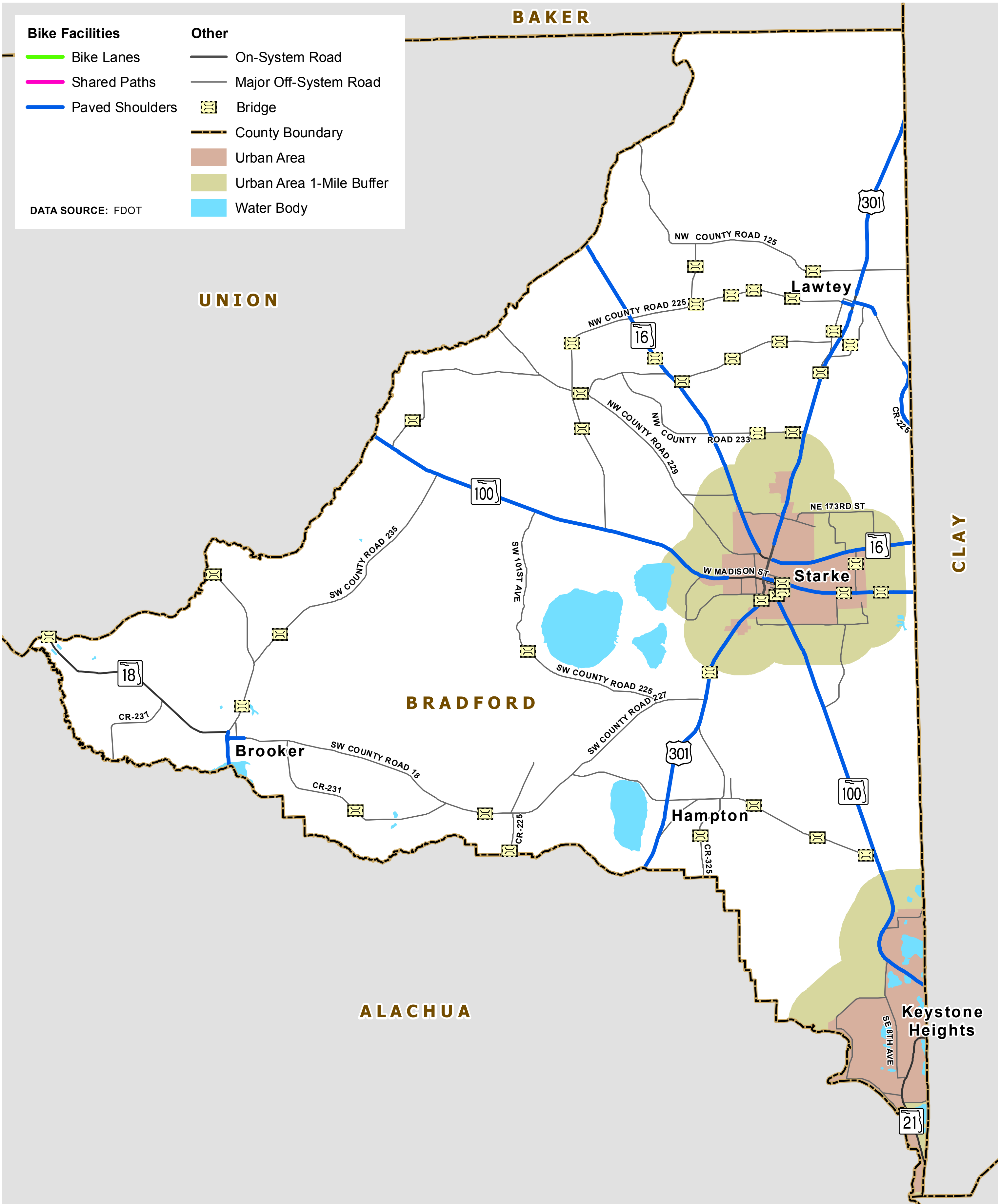
FIGURE A1-1

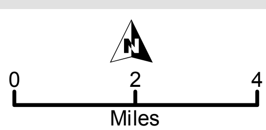



# EXISTING BICYCLE FACILITIES

## BAKER COUNTY

FIGURE A1-2

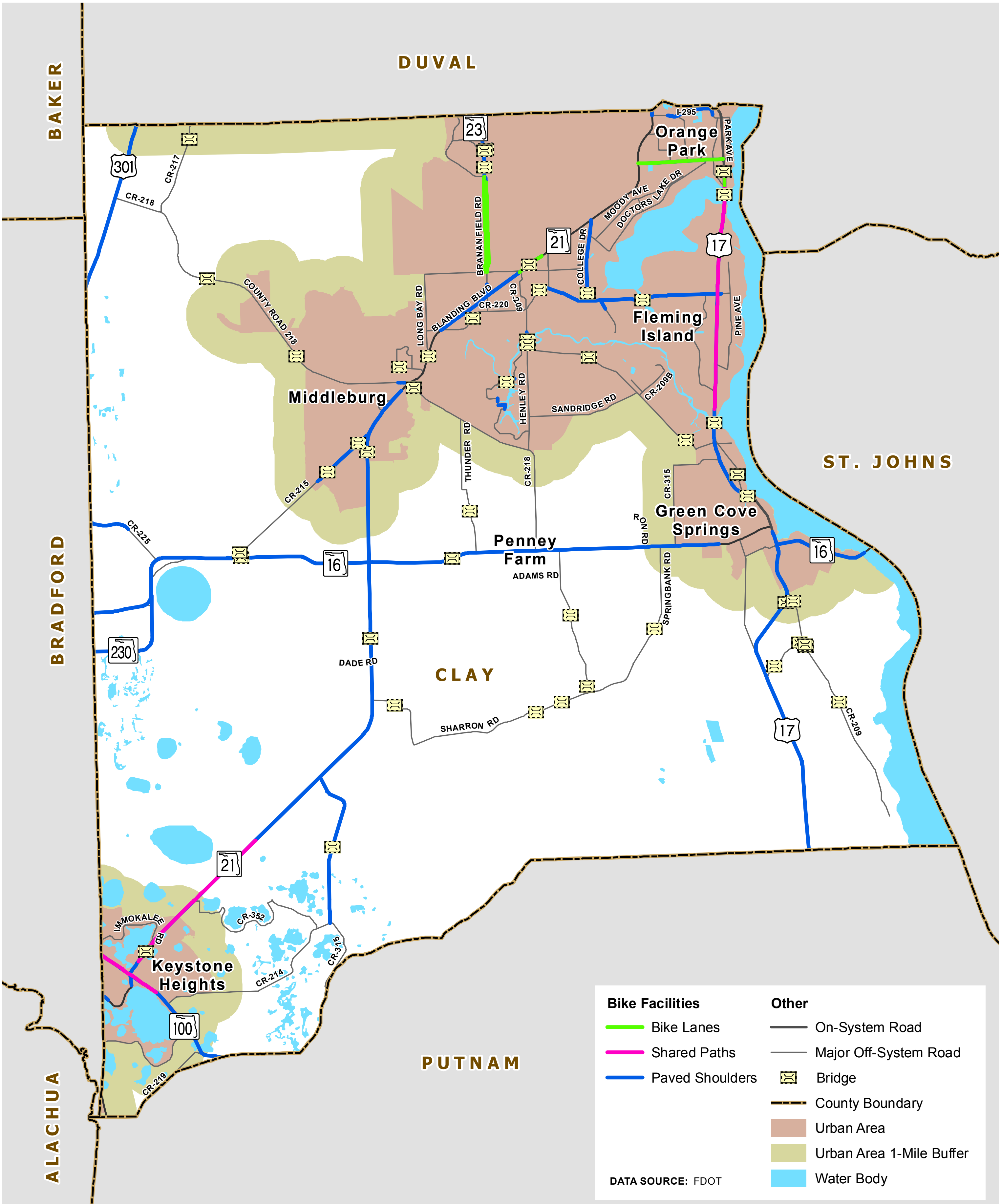


# EXISTING BICYCLE FACILITIES

## BRADFORD COUNTY

FIGURE A1-3



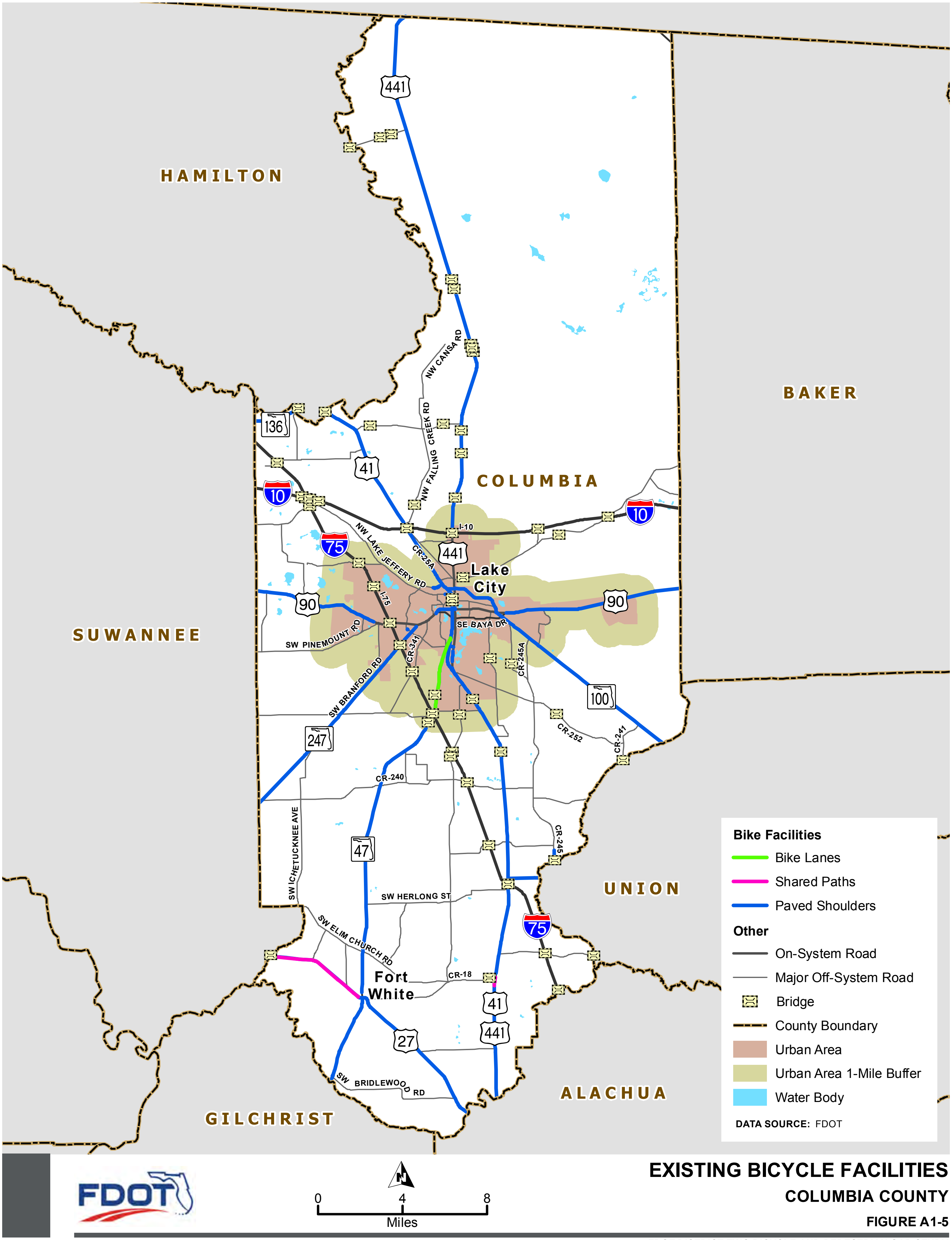

FDOT

# EXISTING BICYCLE FACILITIES

## CLAY COUNTY

FIGURE A1-4

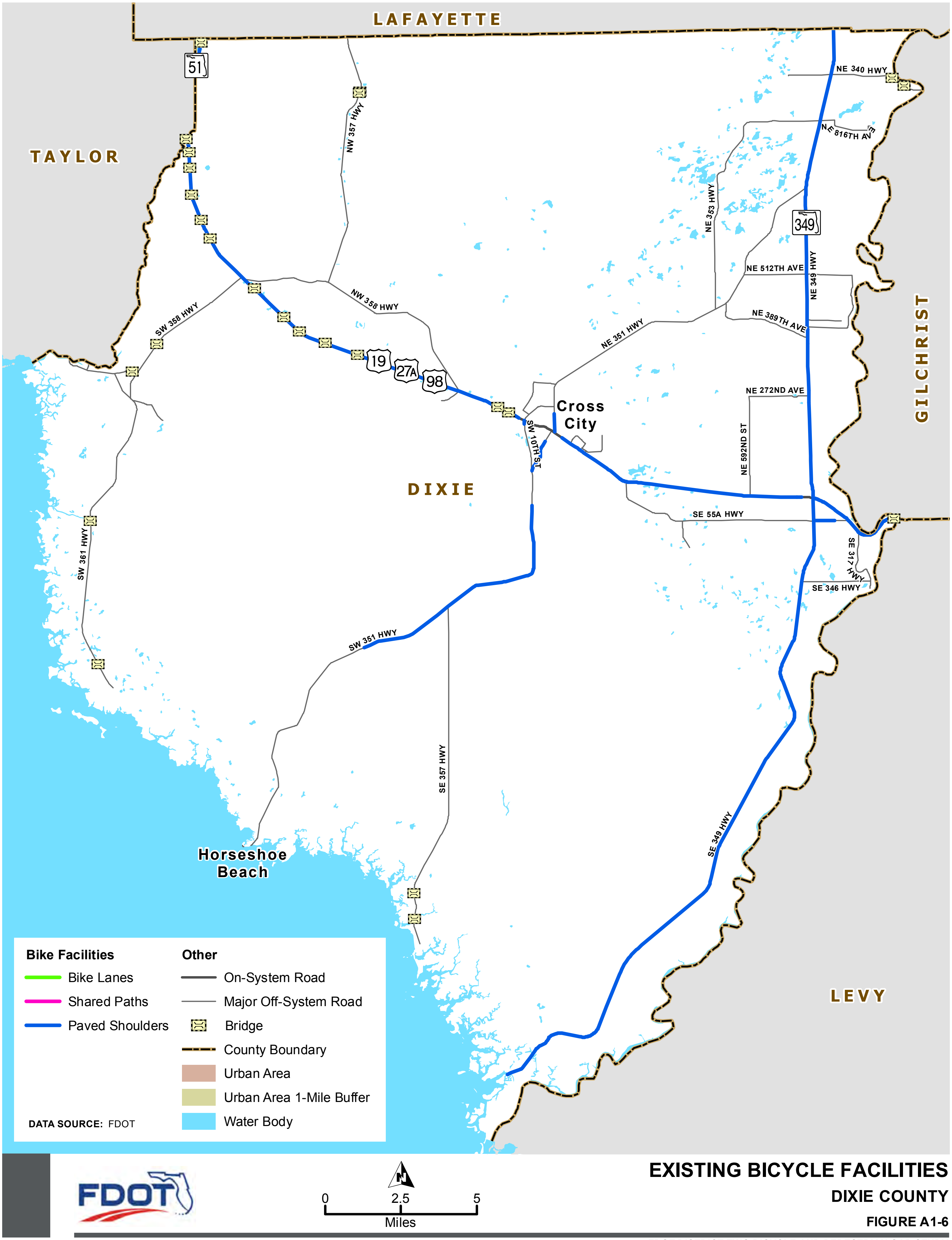
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# EXISTING BICYCLE FACILITIES

## COLUMBIA COUNTY

FIGURE A1-5

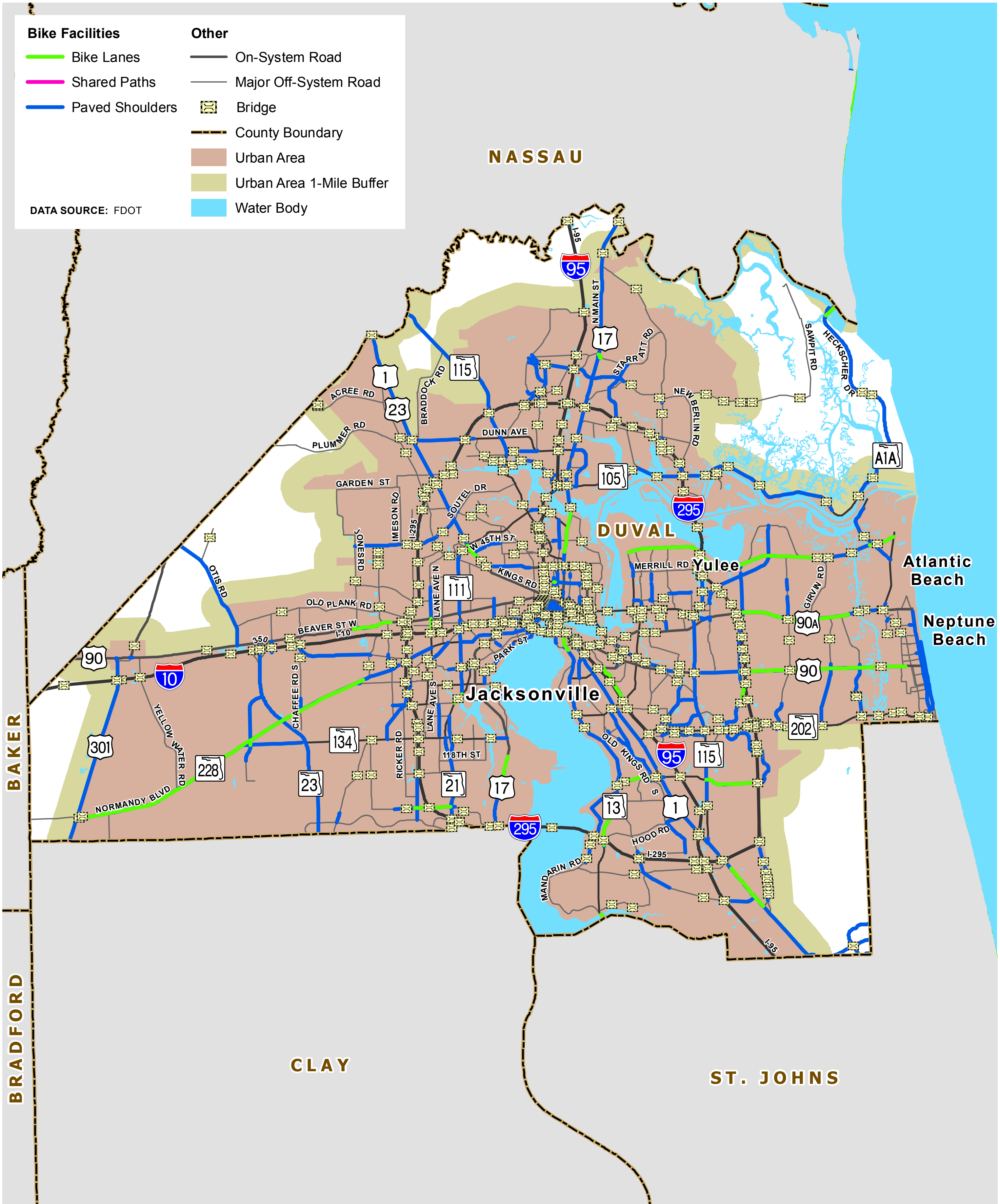



## EXISTING BICYCLE FACILITIES

### DIXIE COUNTY

FIGURE A1-6

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY



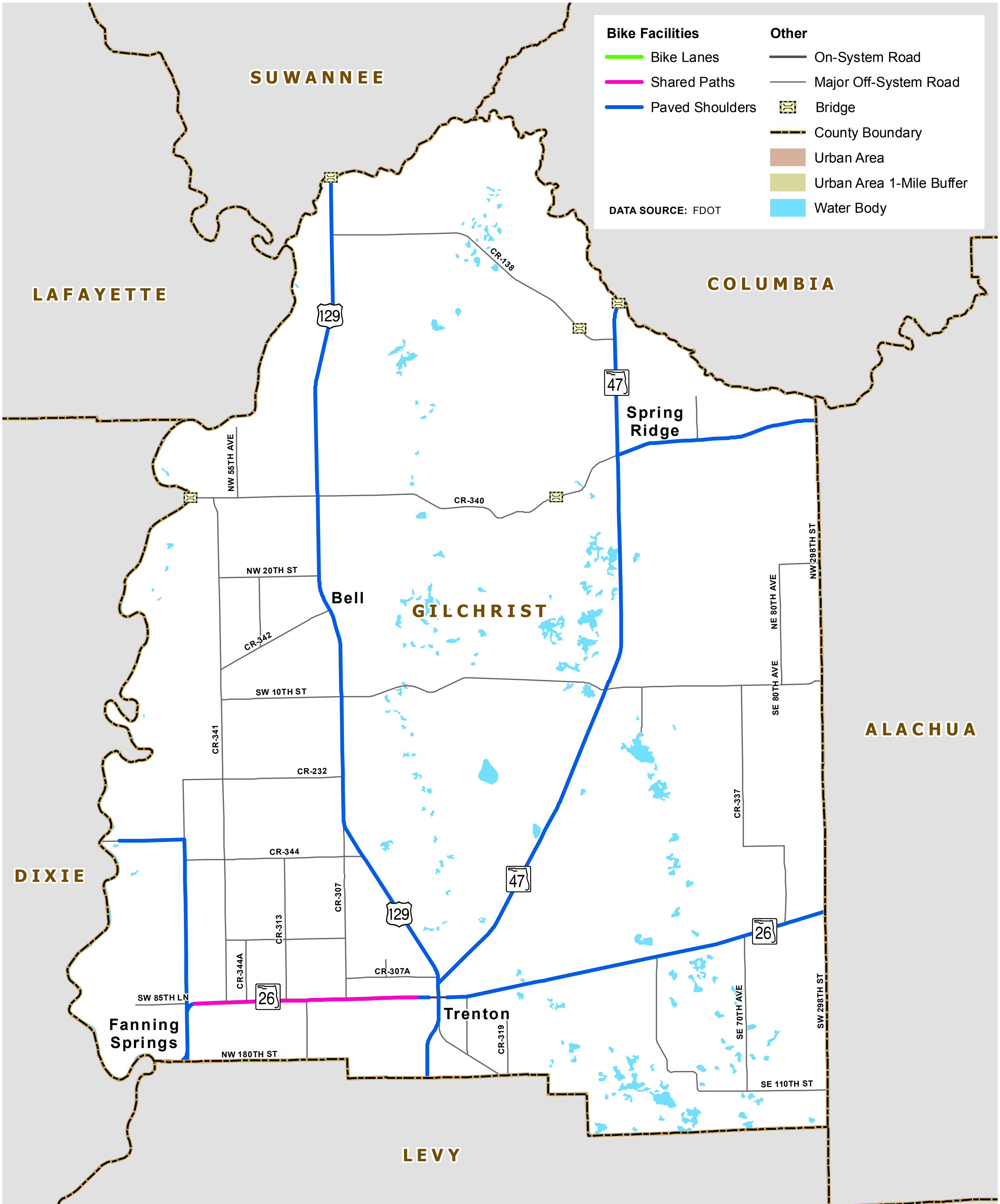

EXISTING BICYCLE FACILITIES

DUVAL COUNTY

FIGURE A1-7

0 4 8
Miles

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

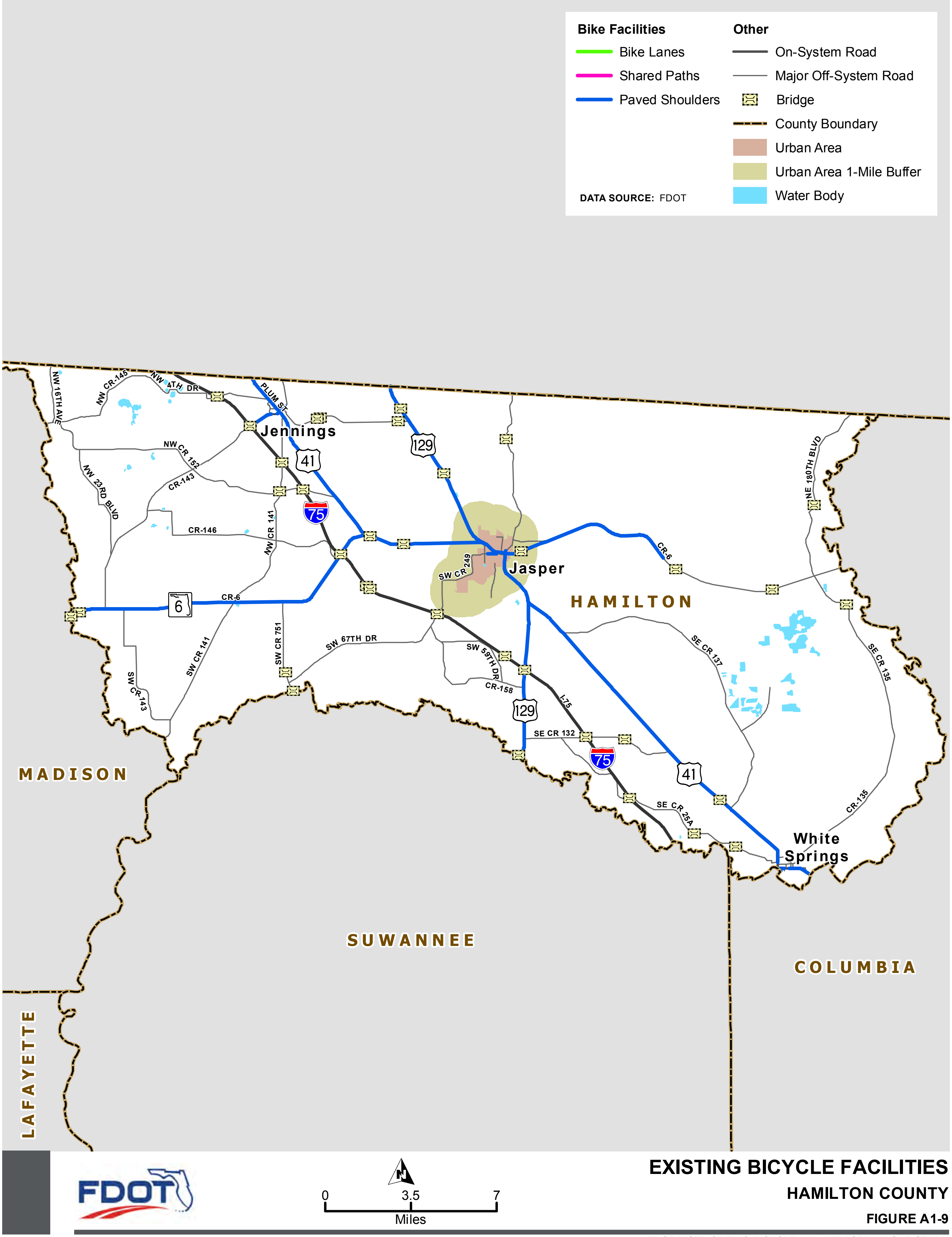



FDOT

# EXISTING BICYCLE FACILITIES

## GILCHRIST COUNTY

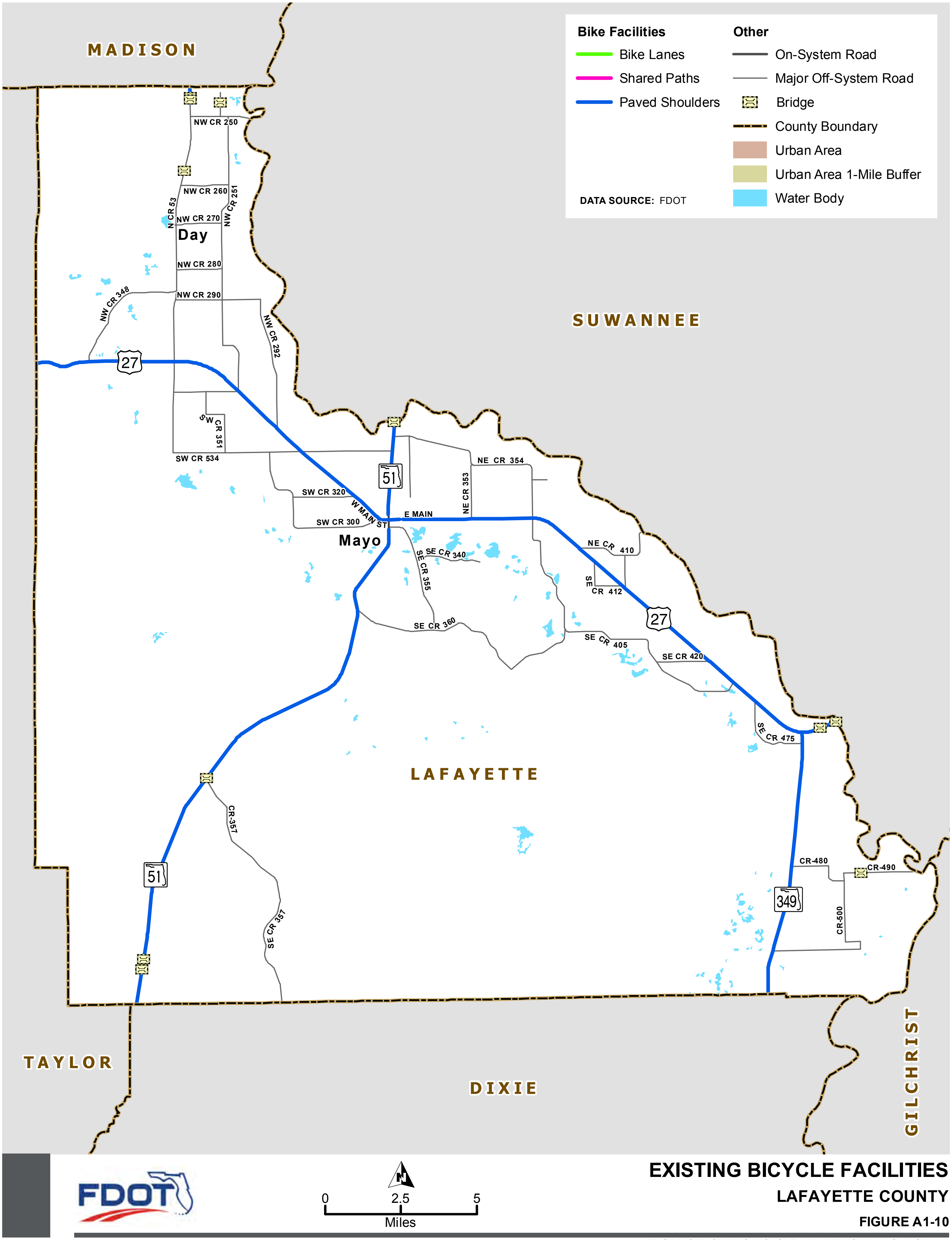
FIGURE A1-8




# EXISTING BICYCLE FACILITIES

## HAMILTON COUNTY

FIGURE A1-9

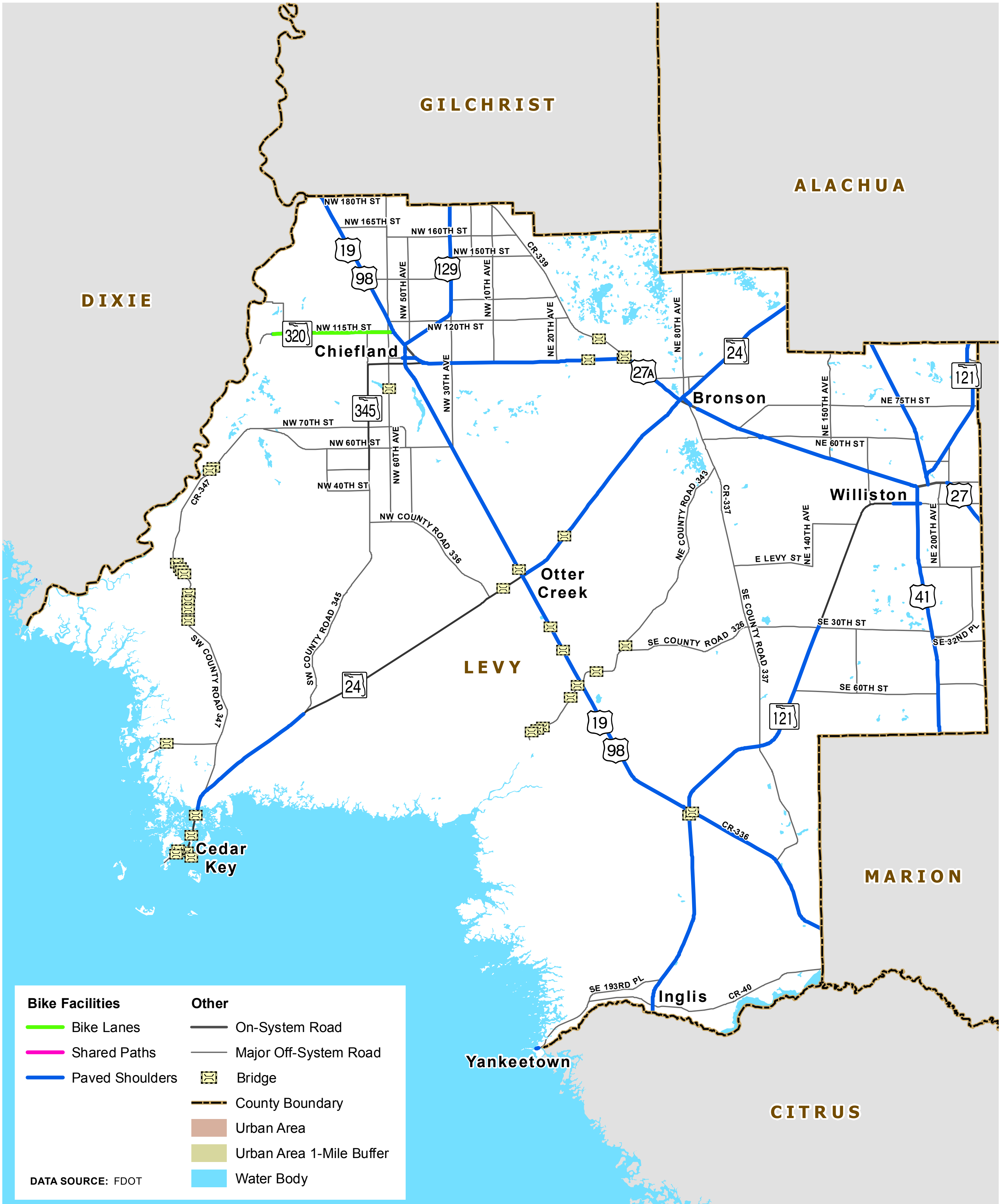



# EXISTING BICYCLE FACILITIES

## LAFAYETTE COUNTY

FIGURE A1-10

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

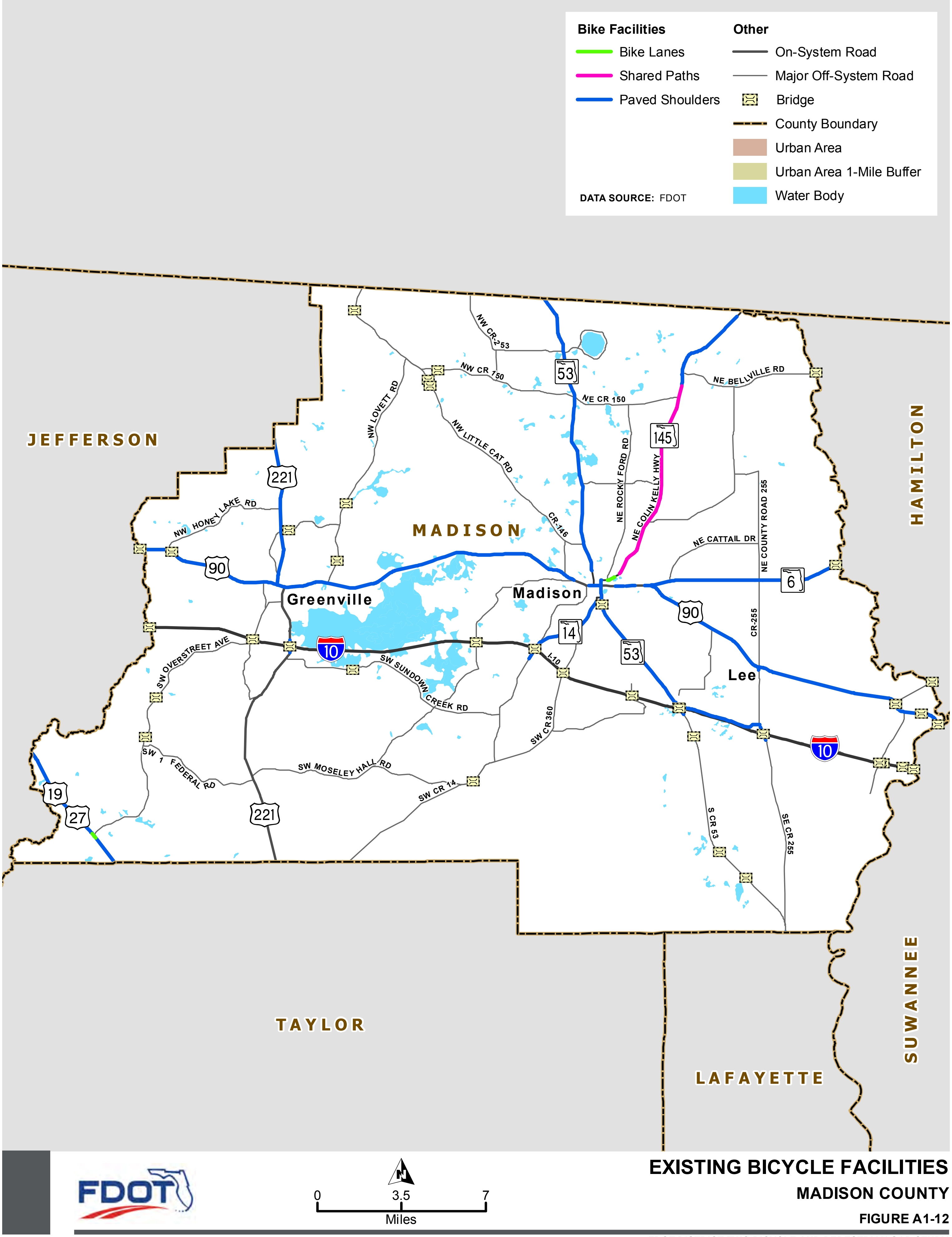



0 4.5 9
Miles

**EXISTING BICYCLE FACILITIES**

**LEVY COUNTY**

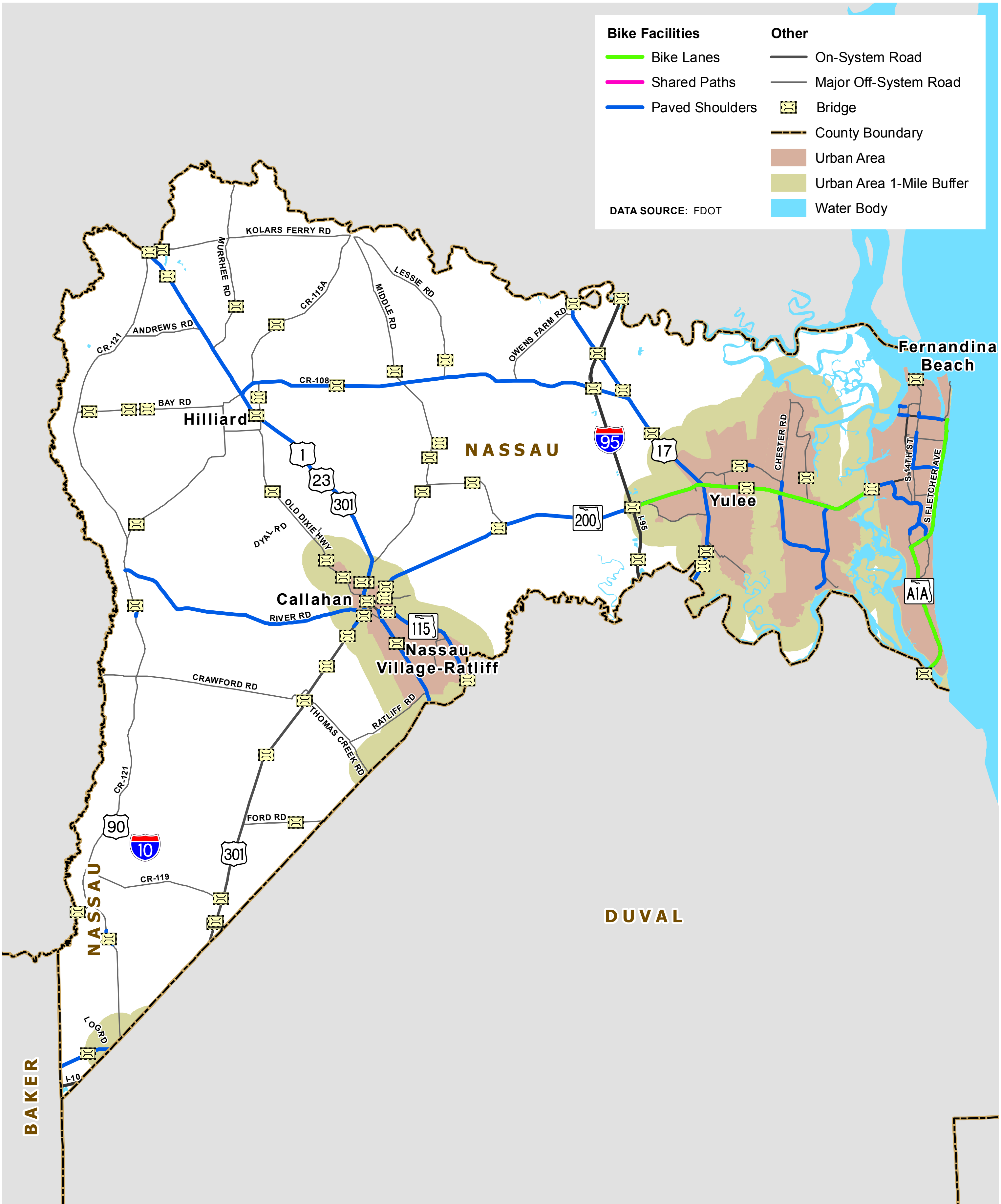
**FIGURE A1-11**




## EXISTING BICYCLE FACILITIES

### MADISON COUNTY

FIGURE A1-12



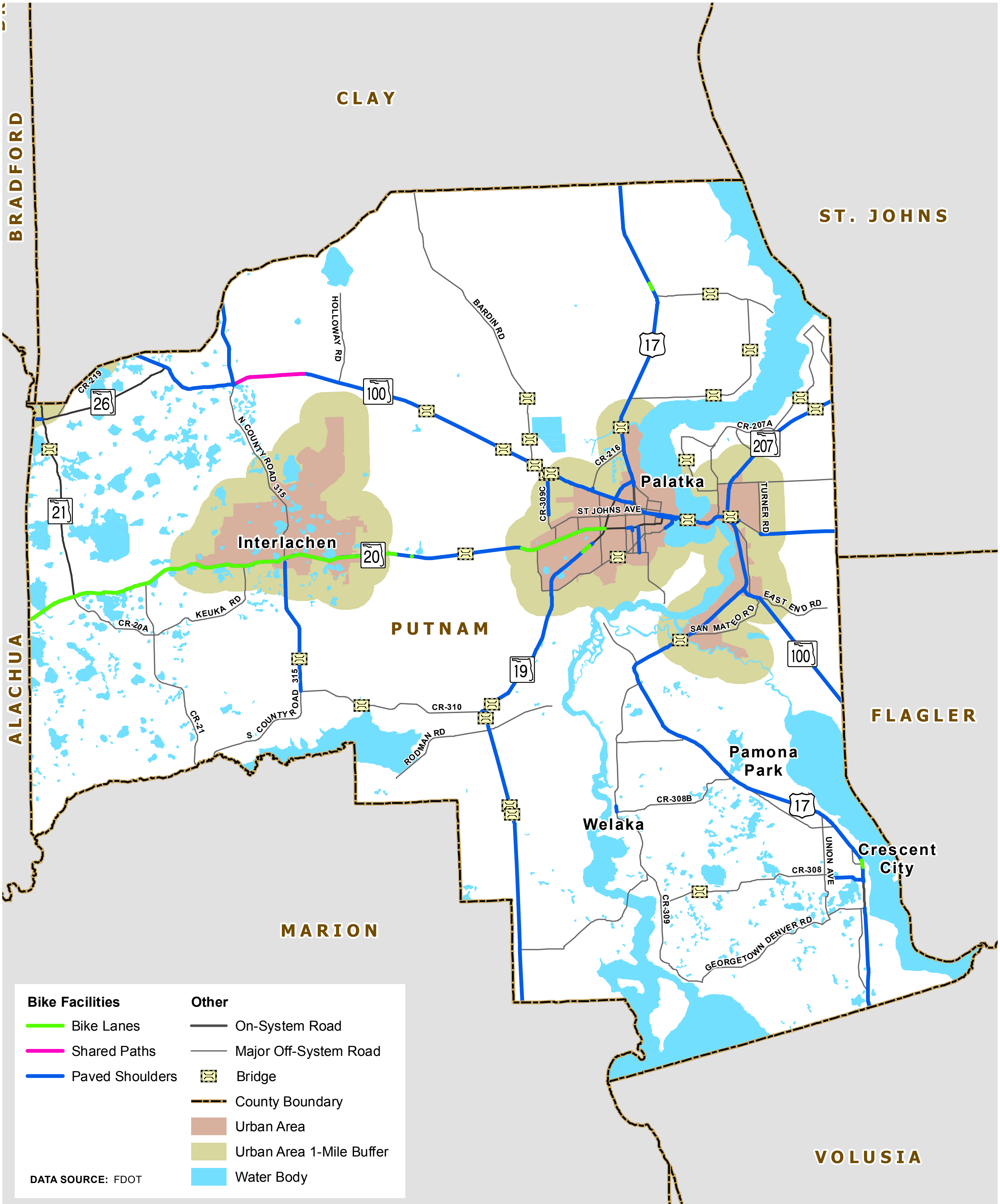

# EXISTING BICYCLE FACILITIES

## NASSAU COUNTY

0 3.5 7
Miles

FIGURE A1-13

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

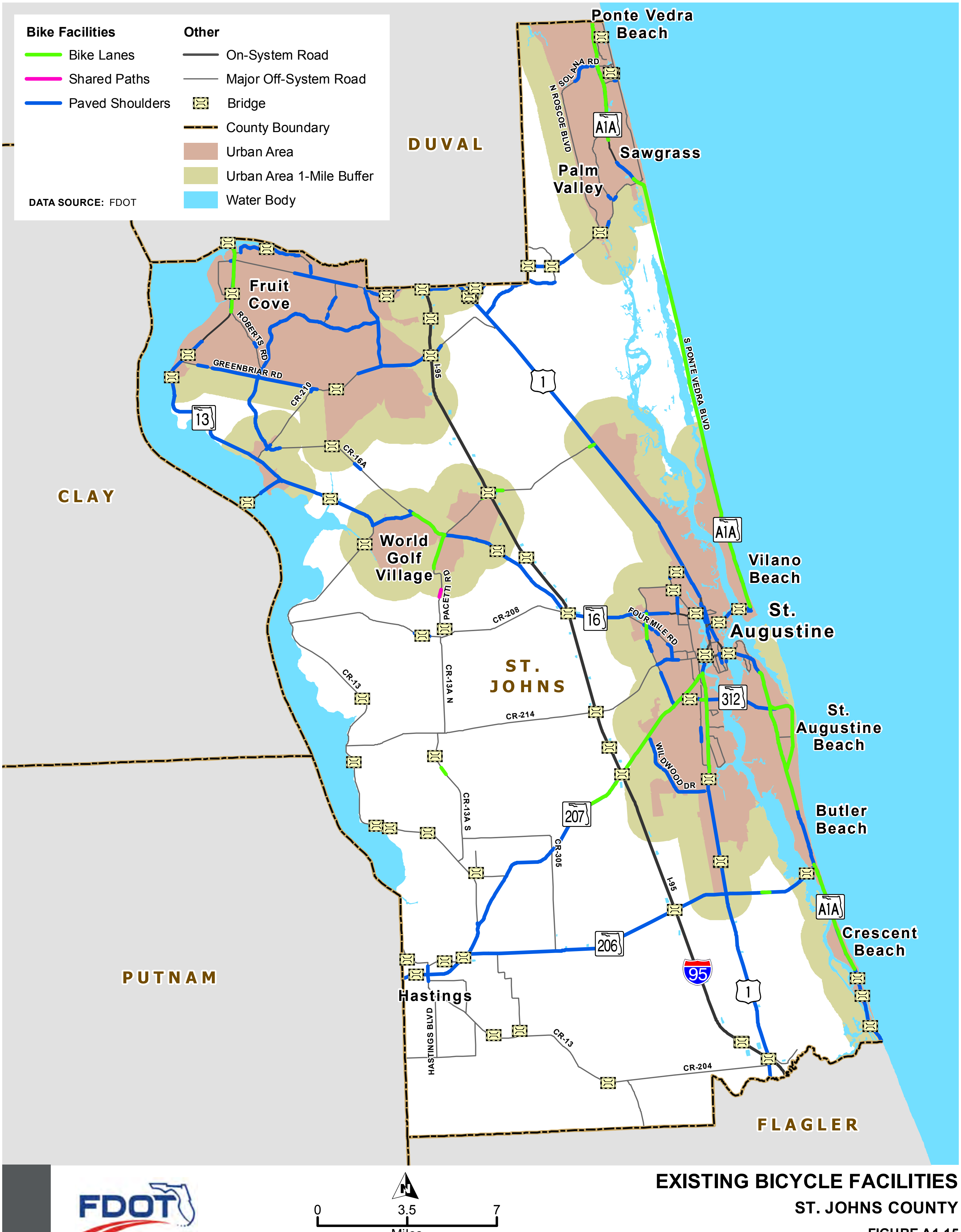



0 3.5 7
Miles

**EXISTING BICYCLE FACILITIES**

**PUTNAM COUNTY**

**FIGURE A1-14**

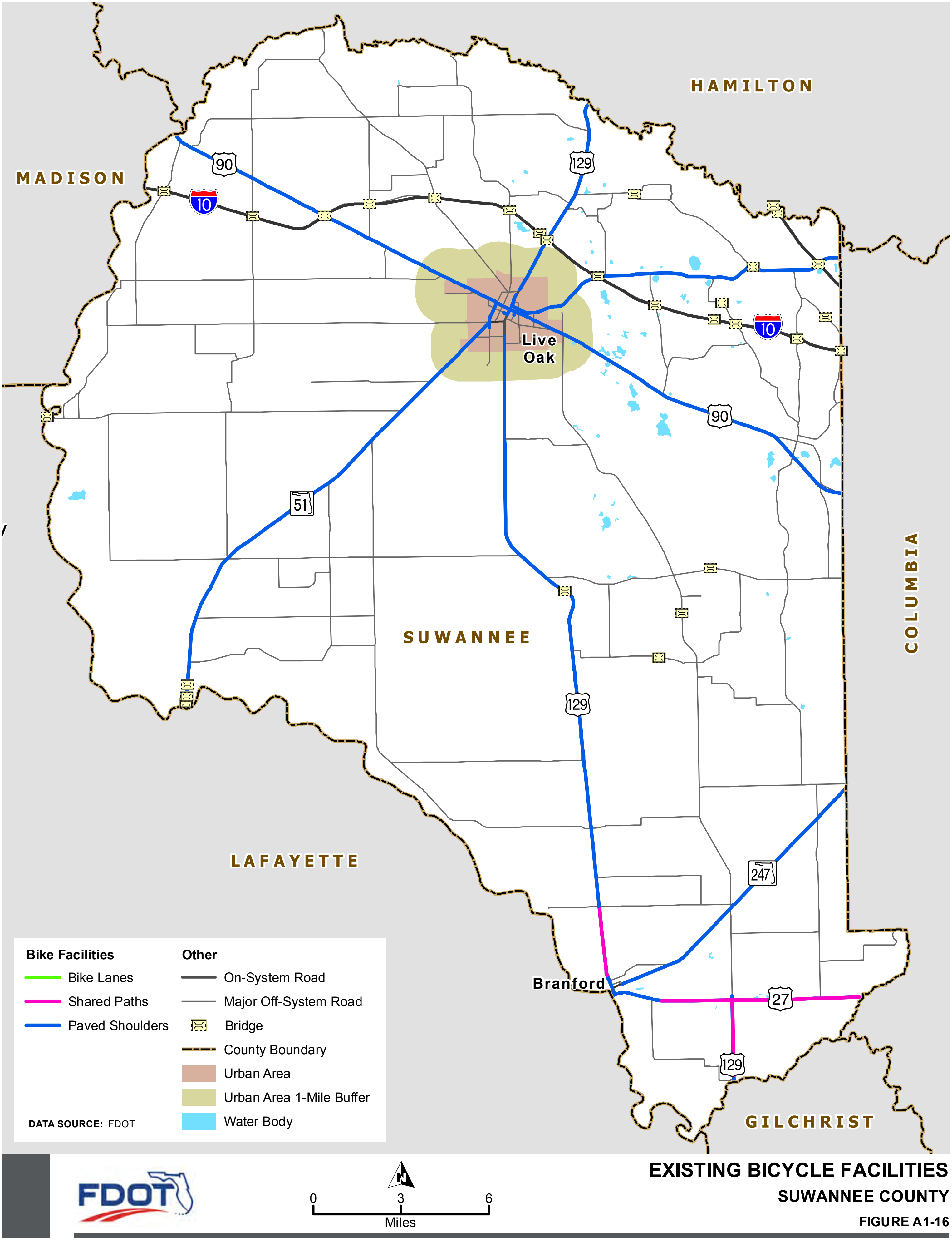



FDOT

EXISTING BICYCLE FACILITIES

ST. JOHNS COUNTY

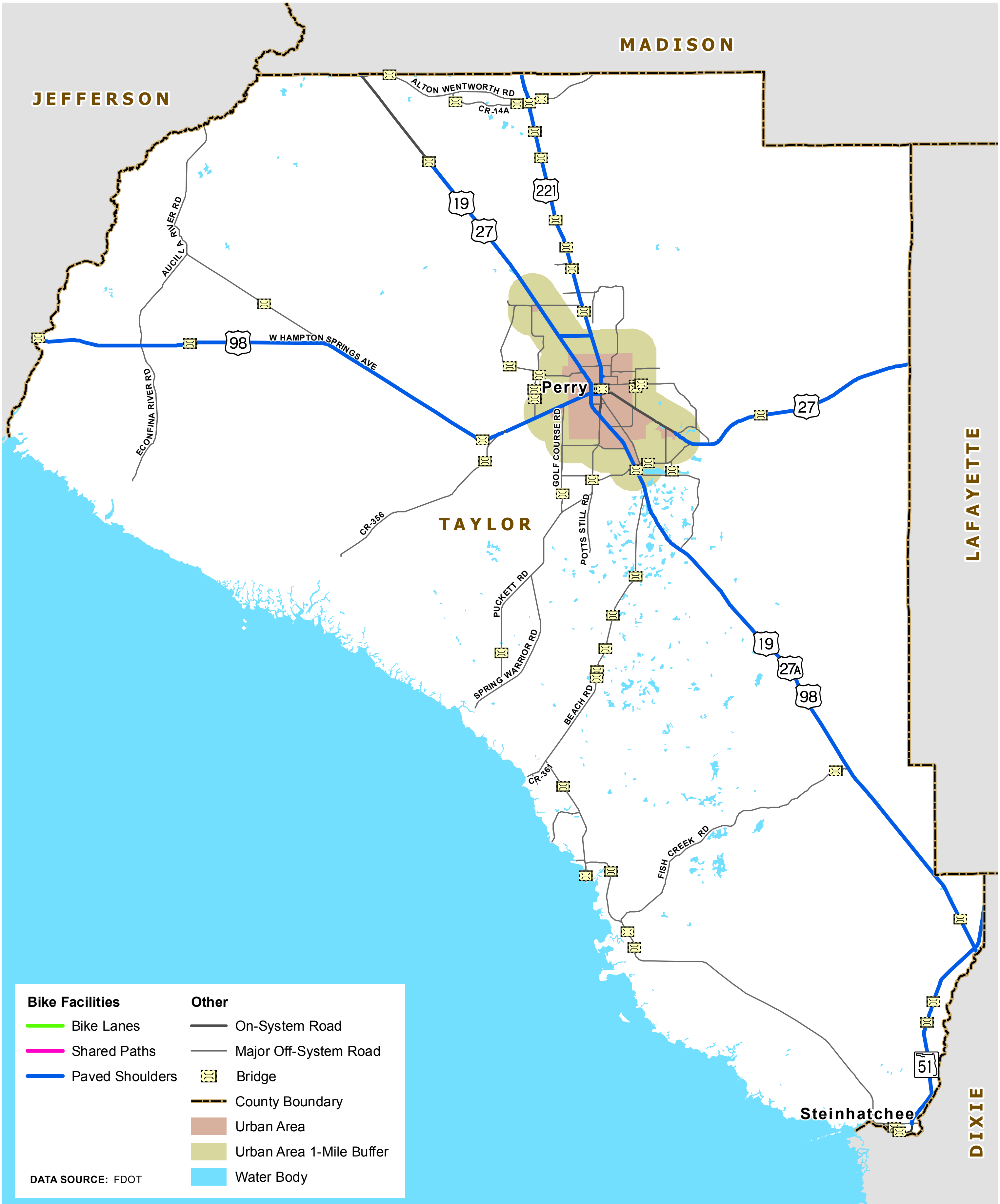
FIGURE A1-15




# EXISTING BICYCLE FACILITIES

## SUWANNEE COUNTY

FIGURE A1-16

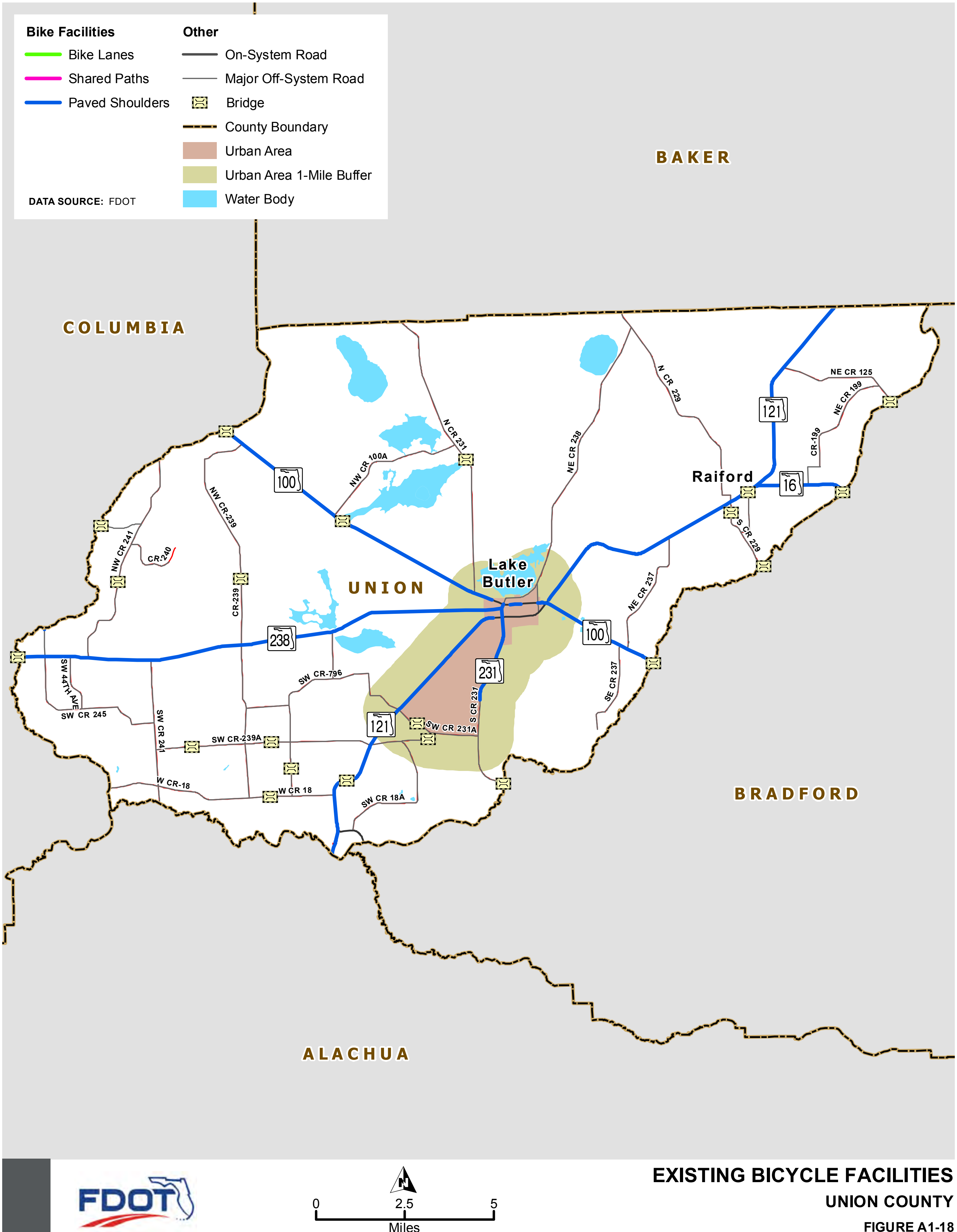



0 3.5 7
Miles

# EXISTING BICYCLE FACILITIES

## TAYLOR COUNTY

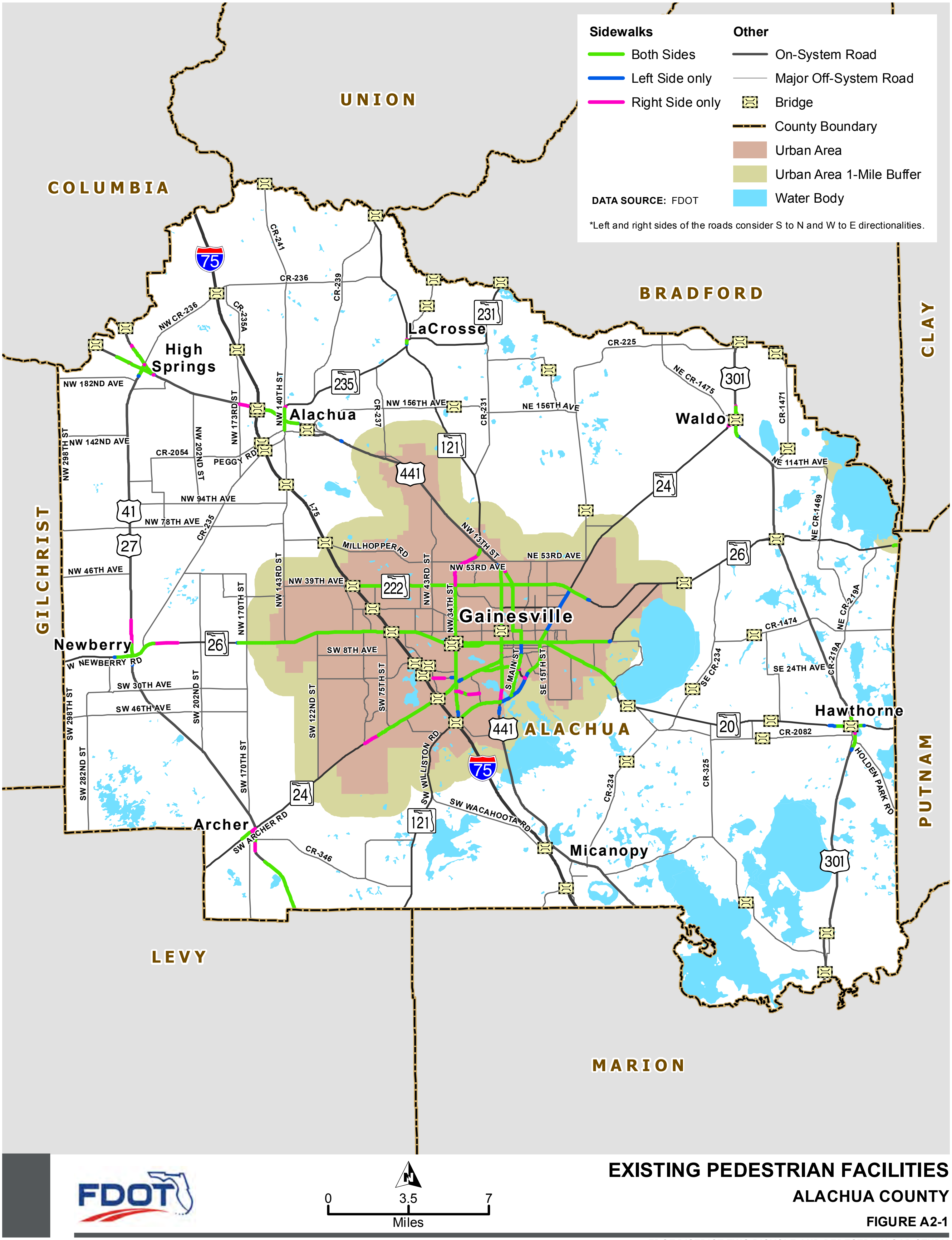
**FIGURE A1-17**




# EXISTING BICYCLE FACILITIES

## UNION COUNTY

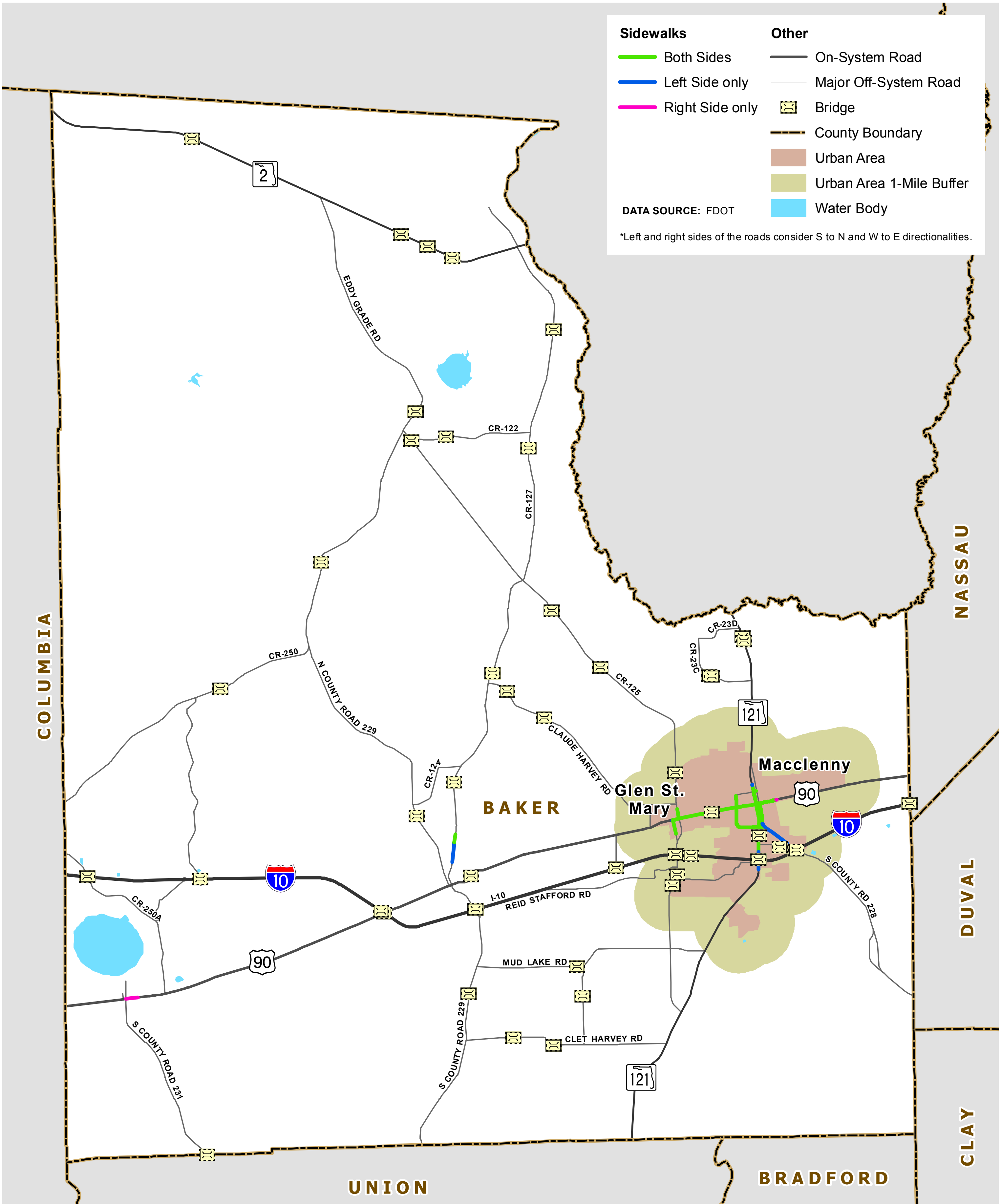
**FIGURE A1-18**




# EXISTING PEDESTRIAN FACILITIES

## ALACHUA COUNTY

FIGURE A2-1

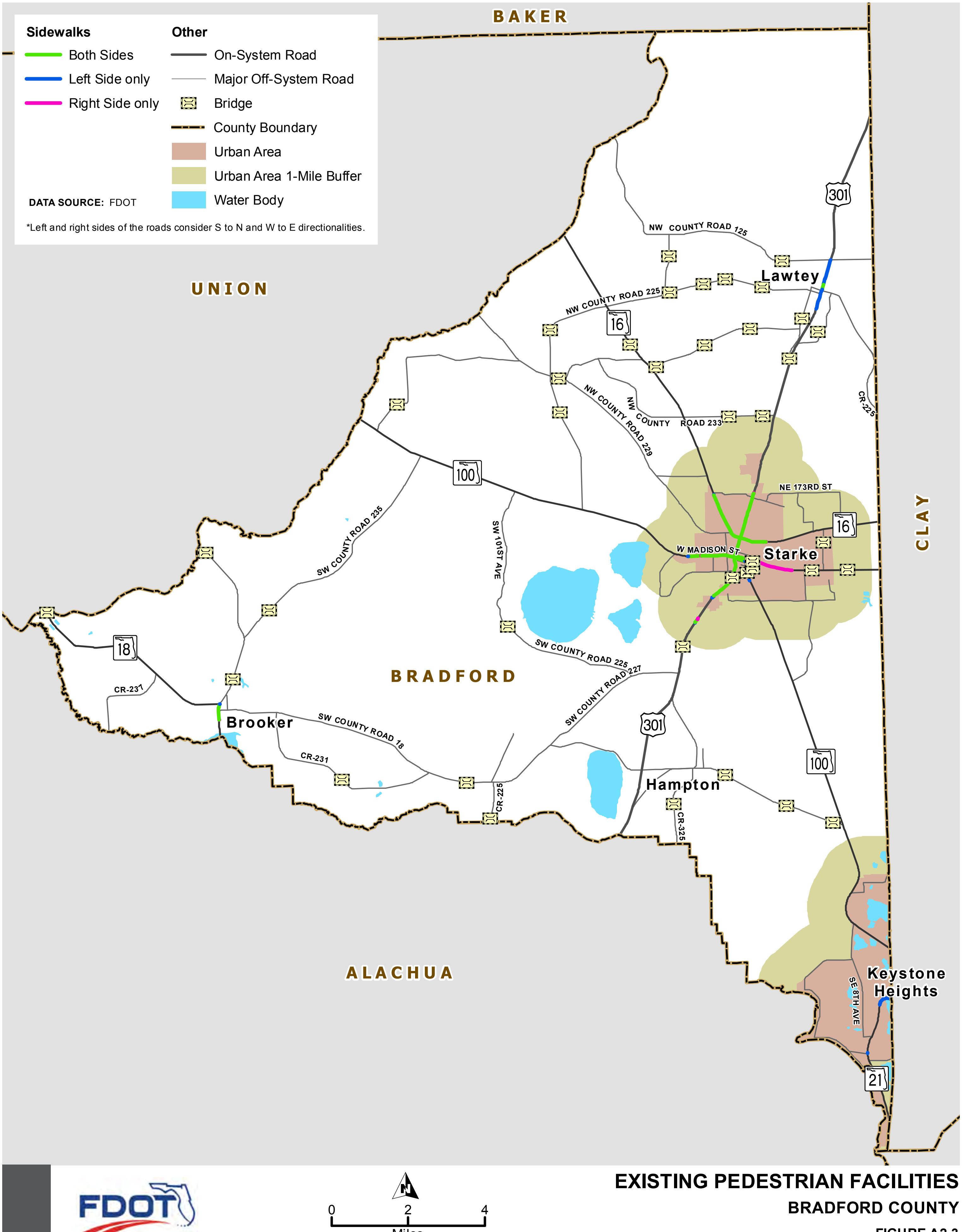



# EXISTING PEDESTRIAN FACILITIES

## BAKER COUNTY

FIGURE A2-2

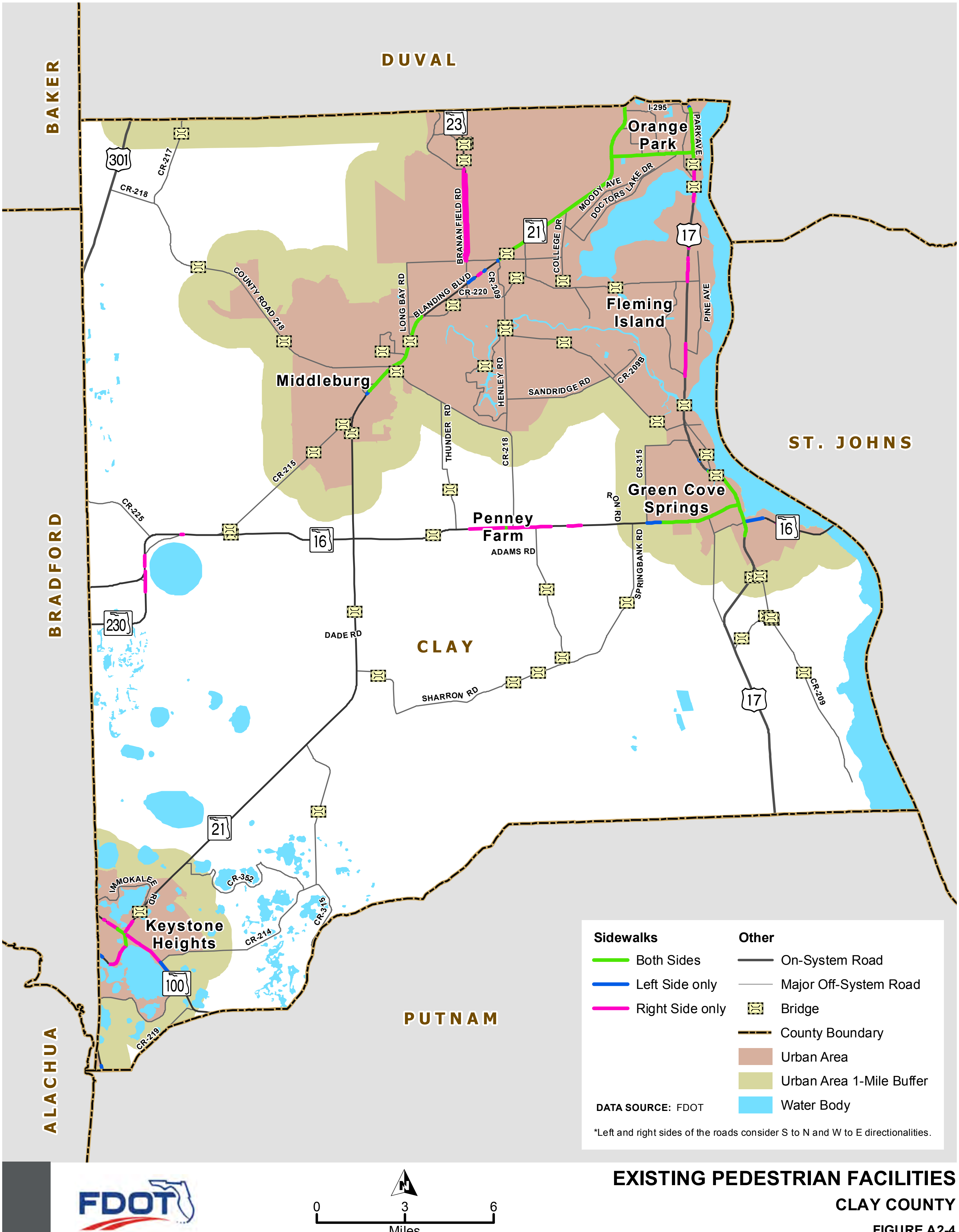
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# EXISTING PEDESTRIAN FACILITIES

## BRADFORD COUNTY

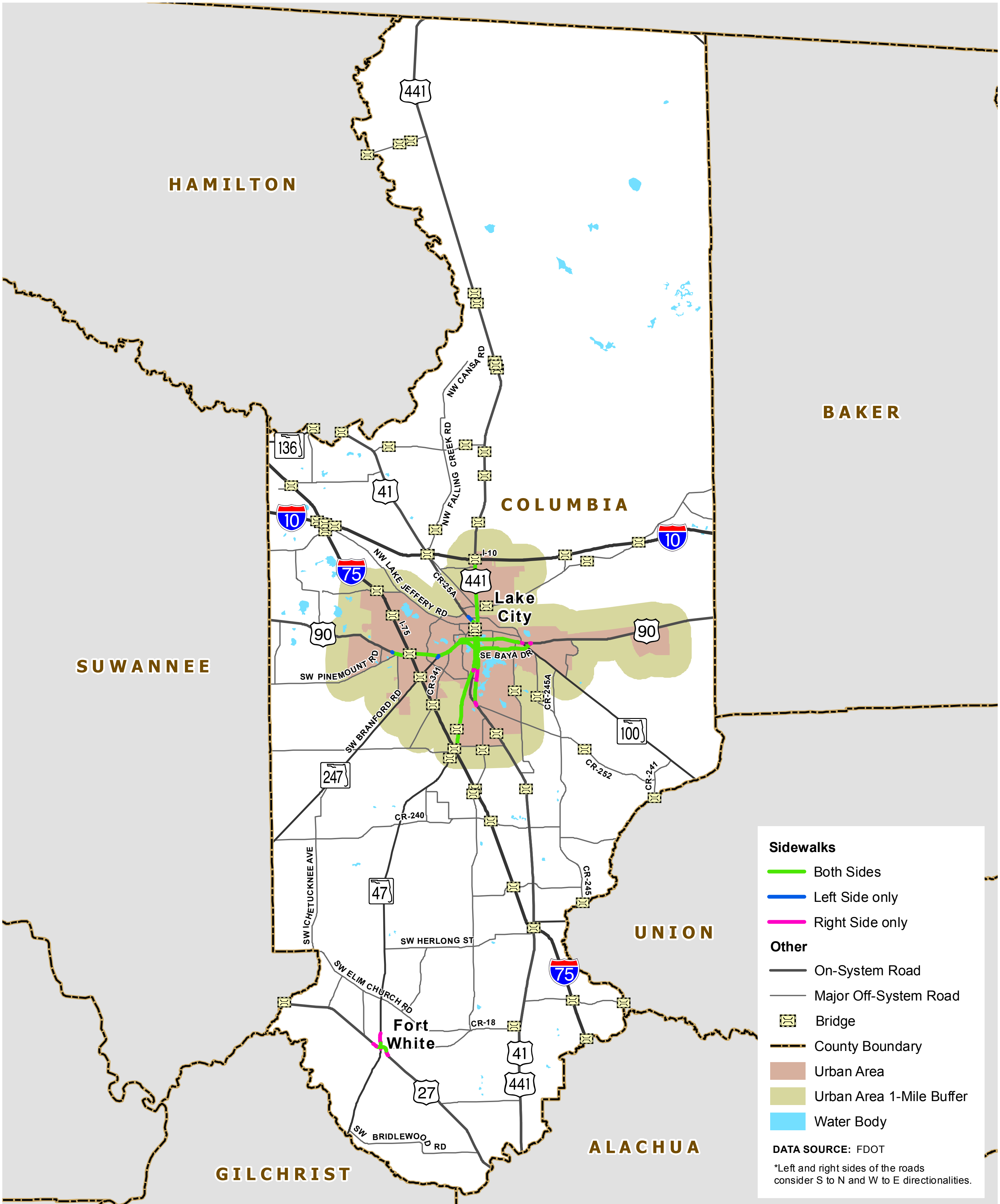
FIGURE A2-3




# EXISTING PEDESTRIAN FACILITIES

## CLAY COUNTY

FIGURE A2-4

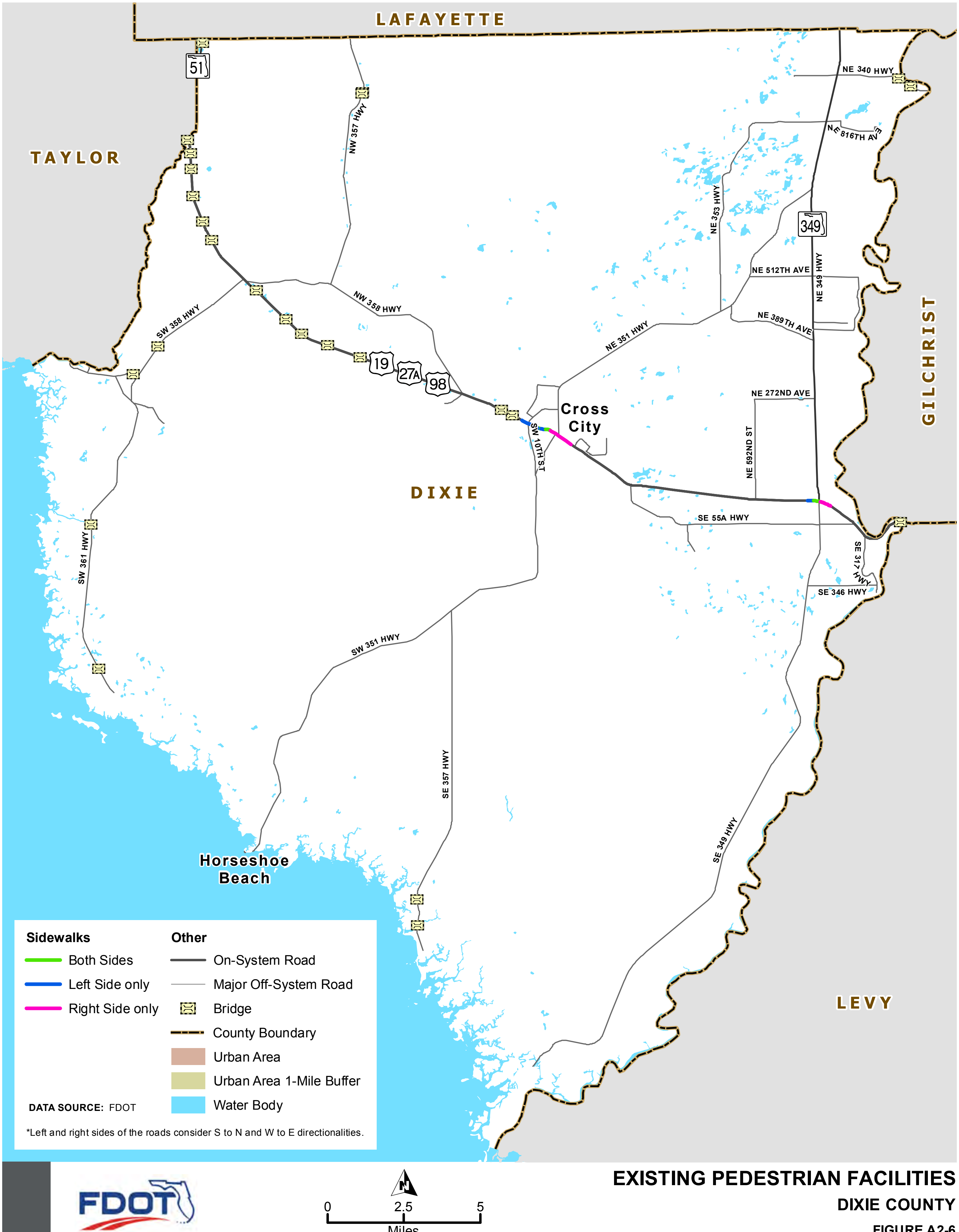



0 4 8
Miles

# EXISTING PEDESTRIAN FACILITIES

## COLUMBIA COUNTY

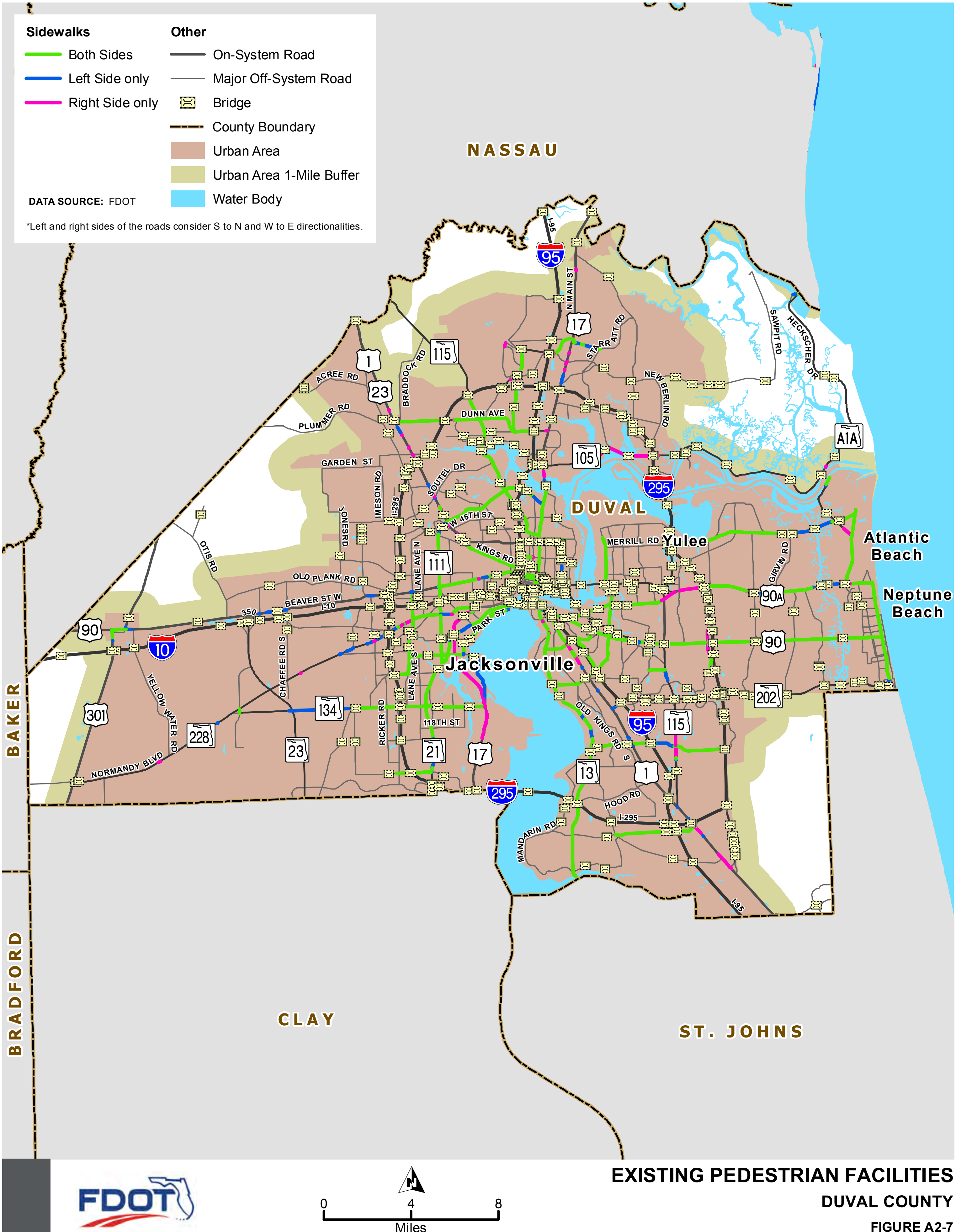
FIGURE A2-5




# EXISTING PEDESTRIAN FACILITIES

## DIXIE COUNTY

**FIGURE A2-6**

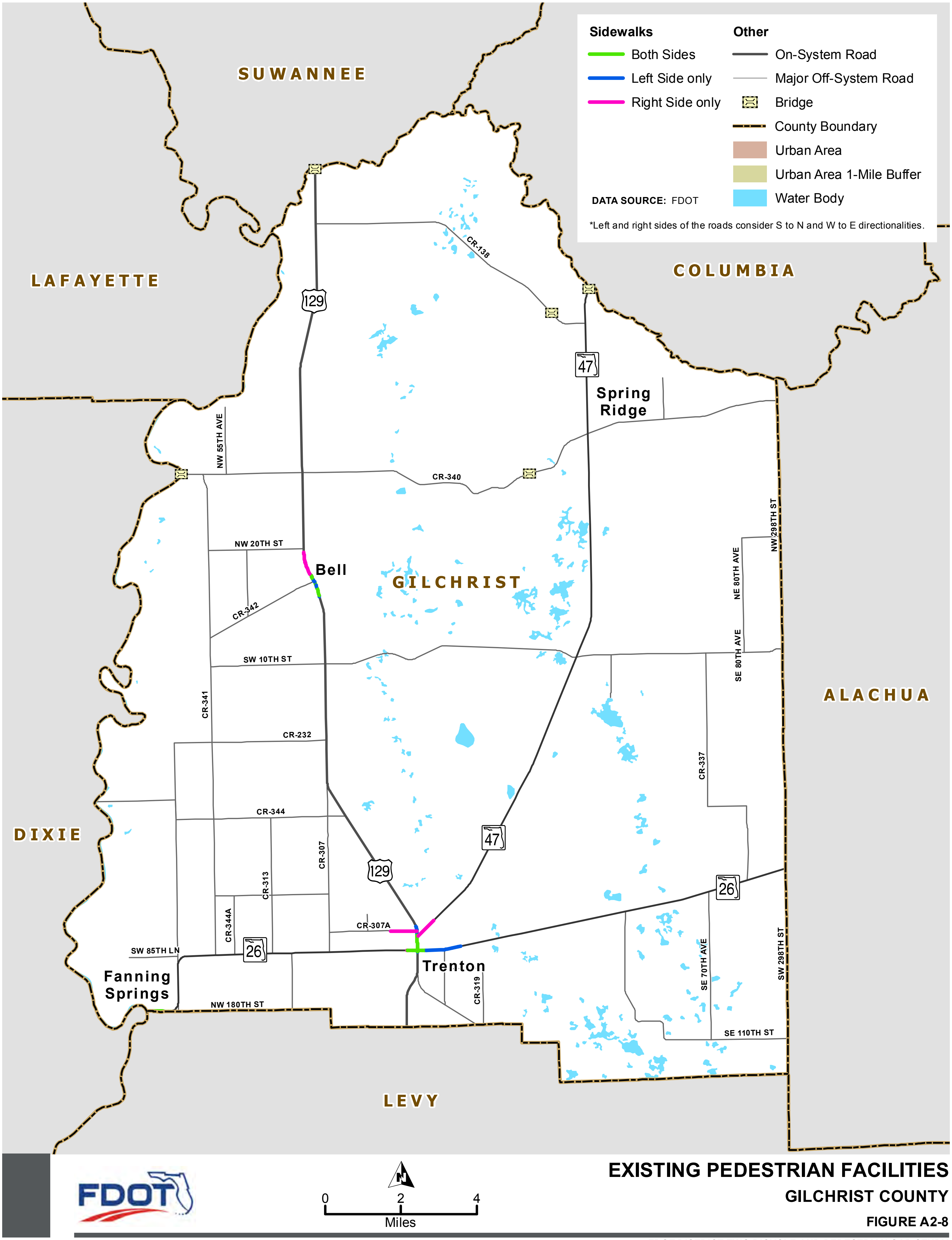



# EXISTING PEDESTRIAN FACILITIES

## DUVAL COUNTY

FIGURE A2-7

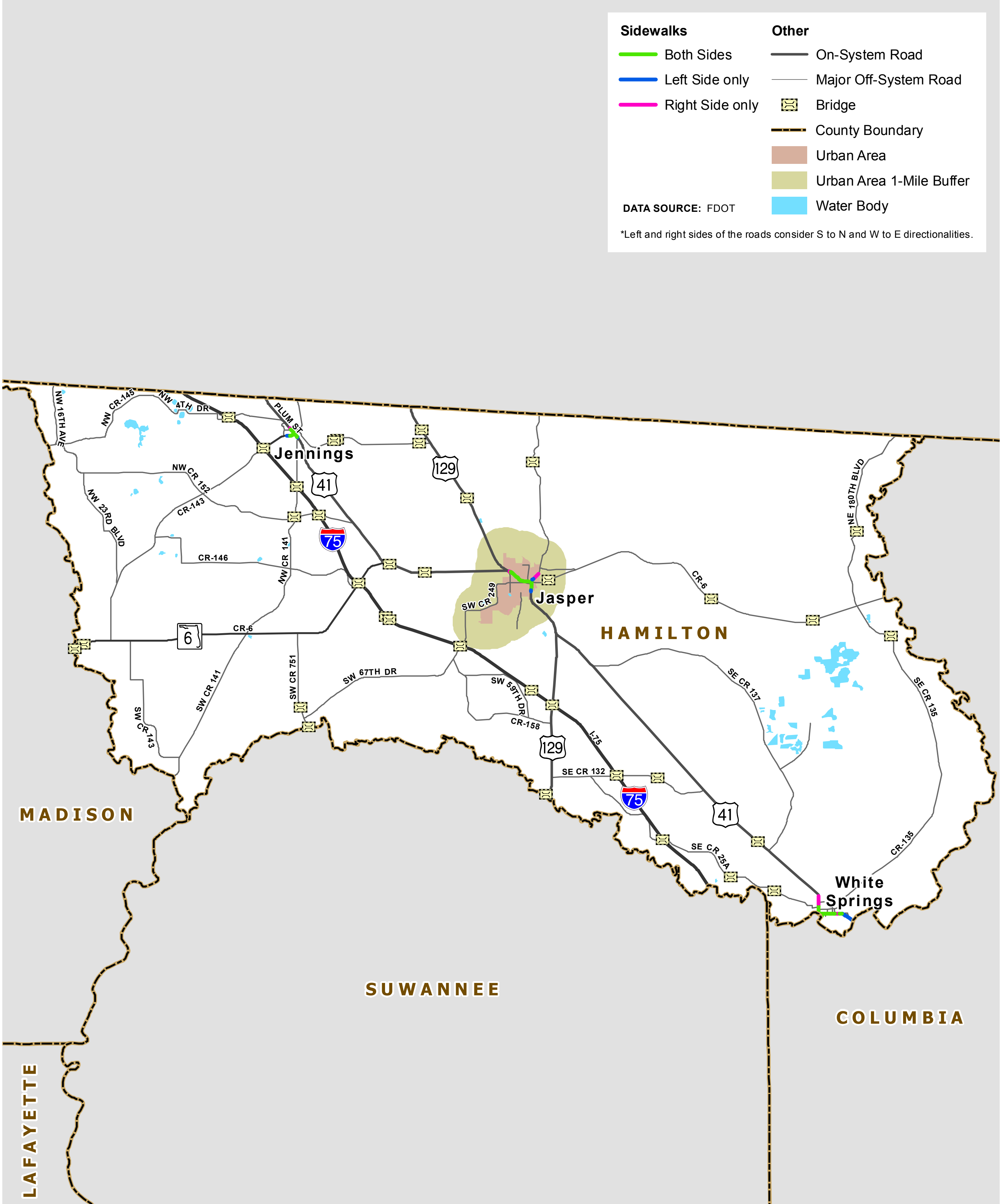
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# EXISTING PEDESTRIAN FACILITIES

## GILCHRIST COUNTY

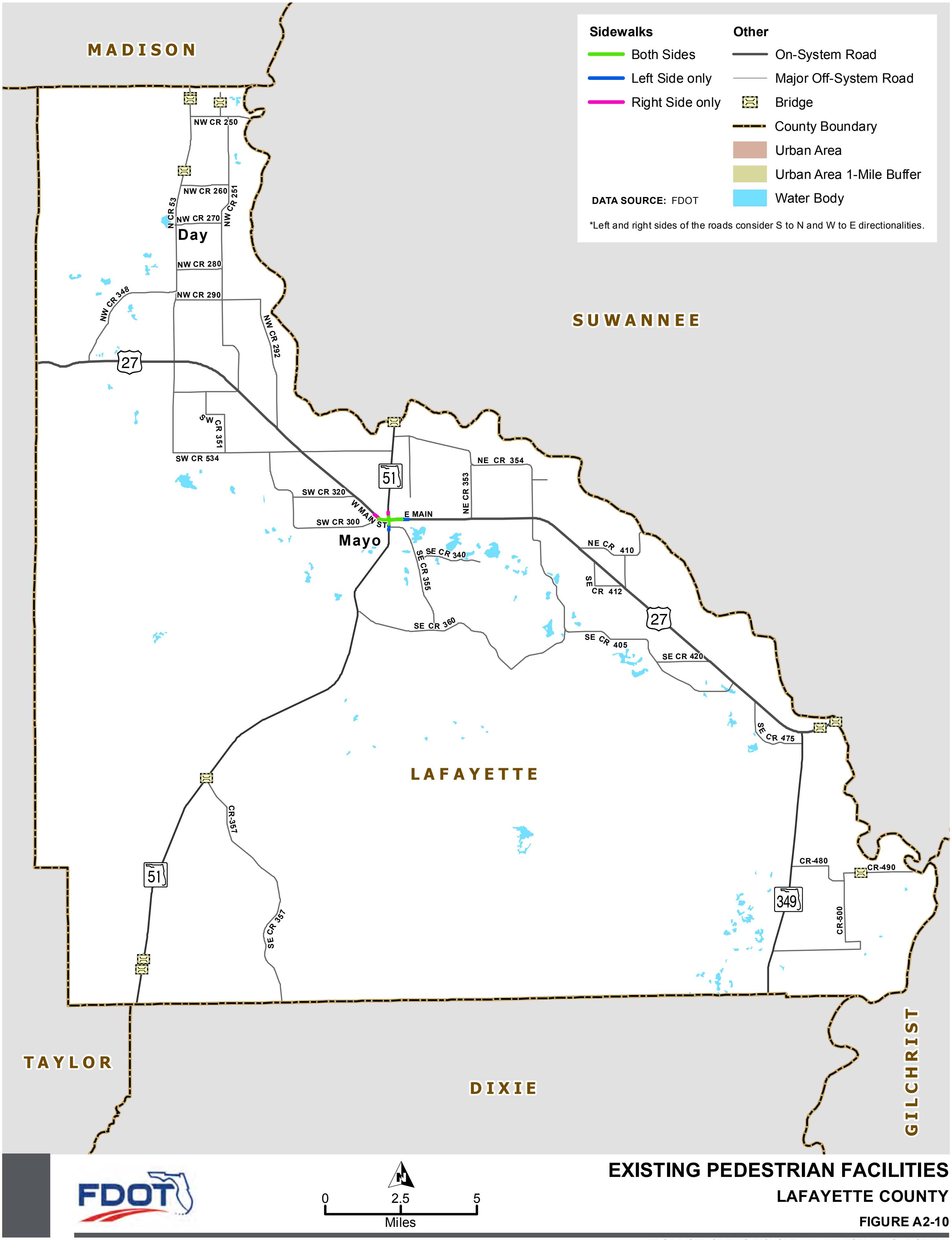
FIGURE A2-8




# EXISTING PEDESTRIAN FACILITIES

## HAMILTON COUNTY

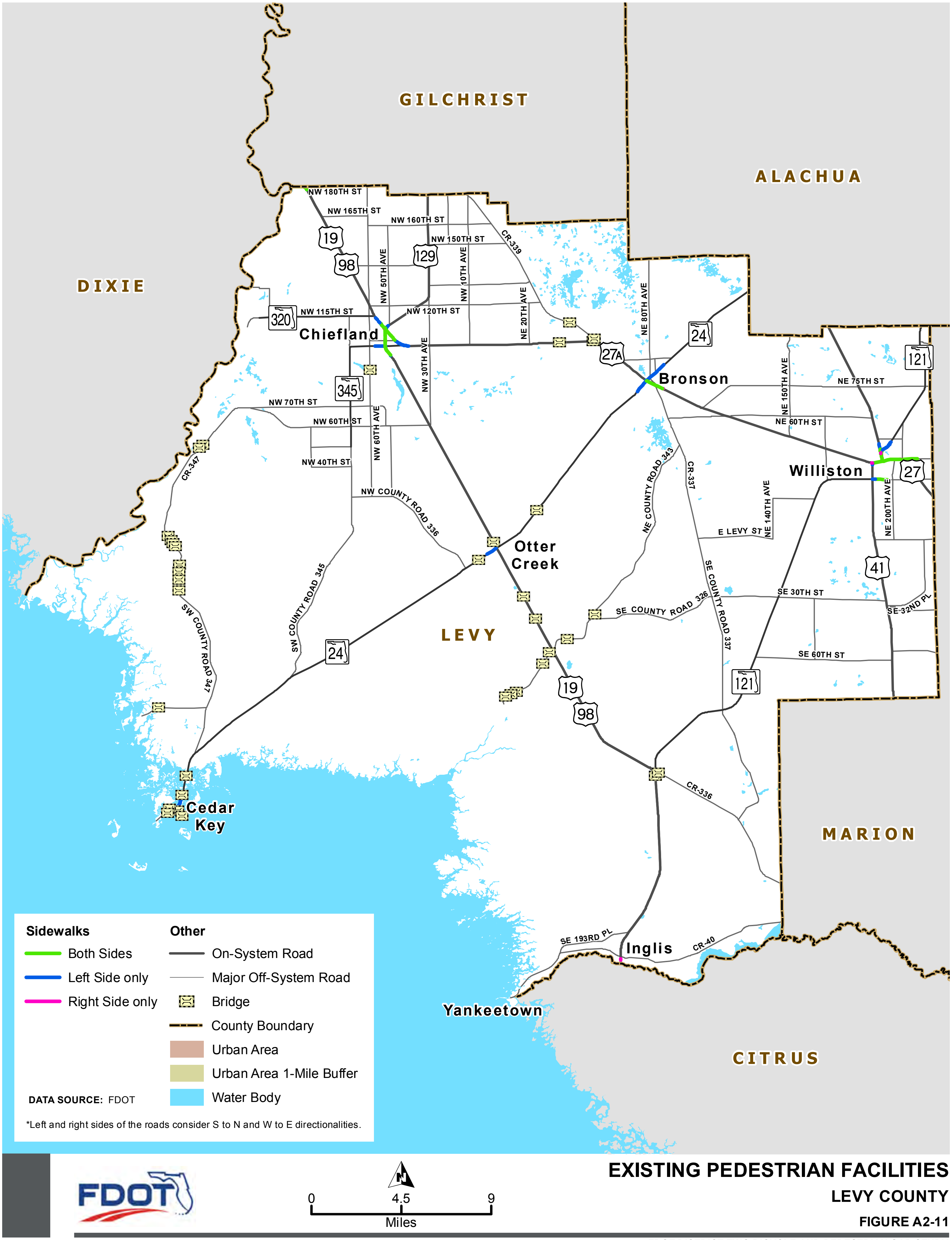
FIGURE A2-9




# EXISTING PEDESTRIAN FACILITIES

## LAFAYETTE COUNTY

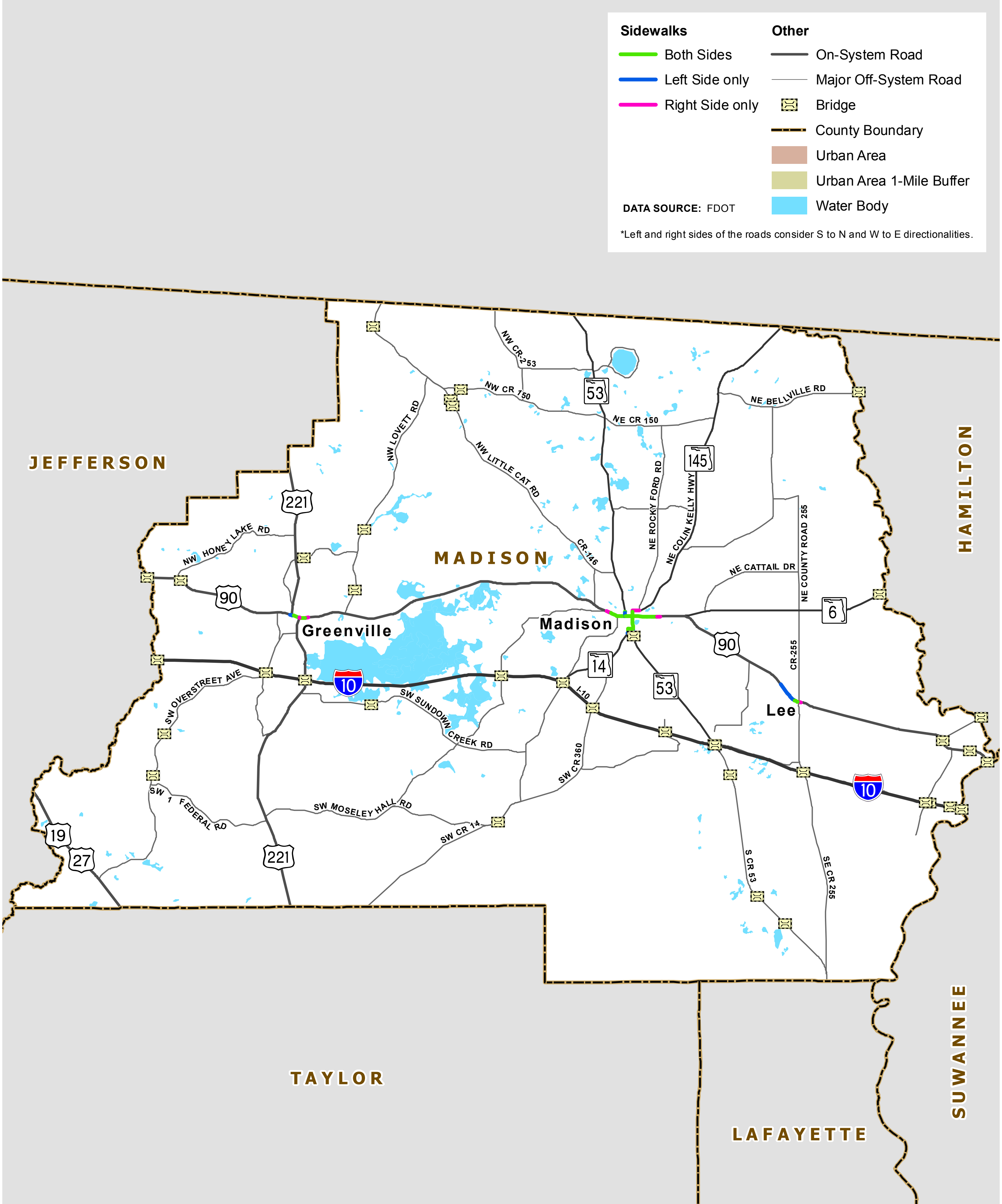
FIGURE A2-10




# EXISTING PEDESTRIAN FACILITIES

## LEVY COUNTY

FIGURE A2-11



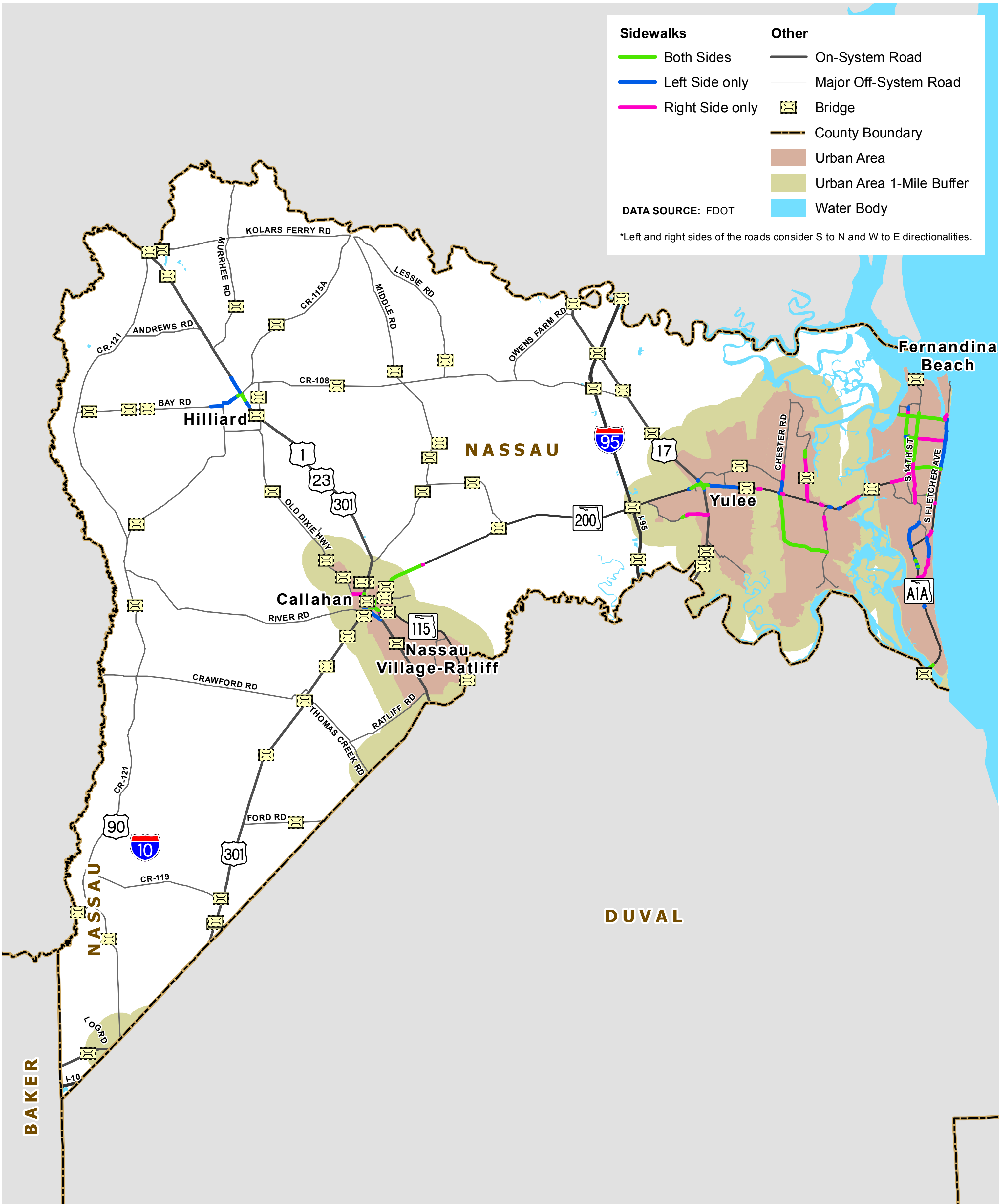

0 3.5 7
Miles

# EXISTING PEDESTRIAN FACILITIES

## MADISON COUNTY

FIGURE A2-12

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY



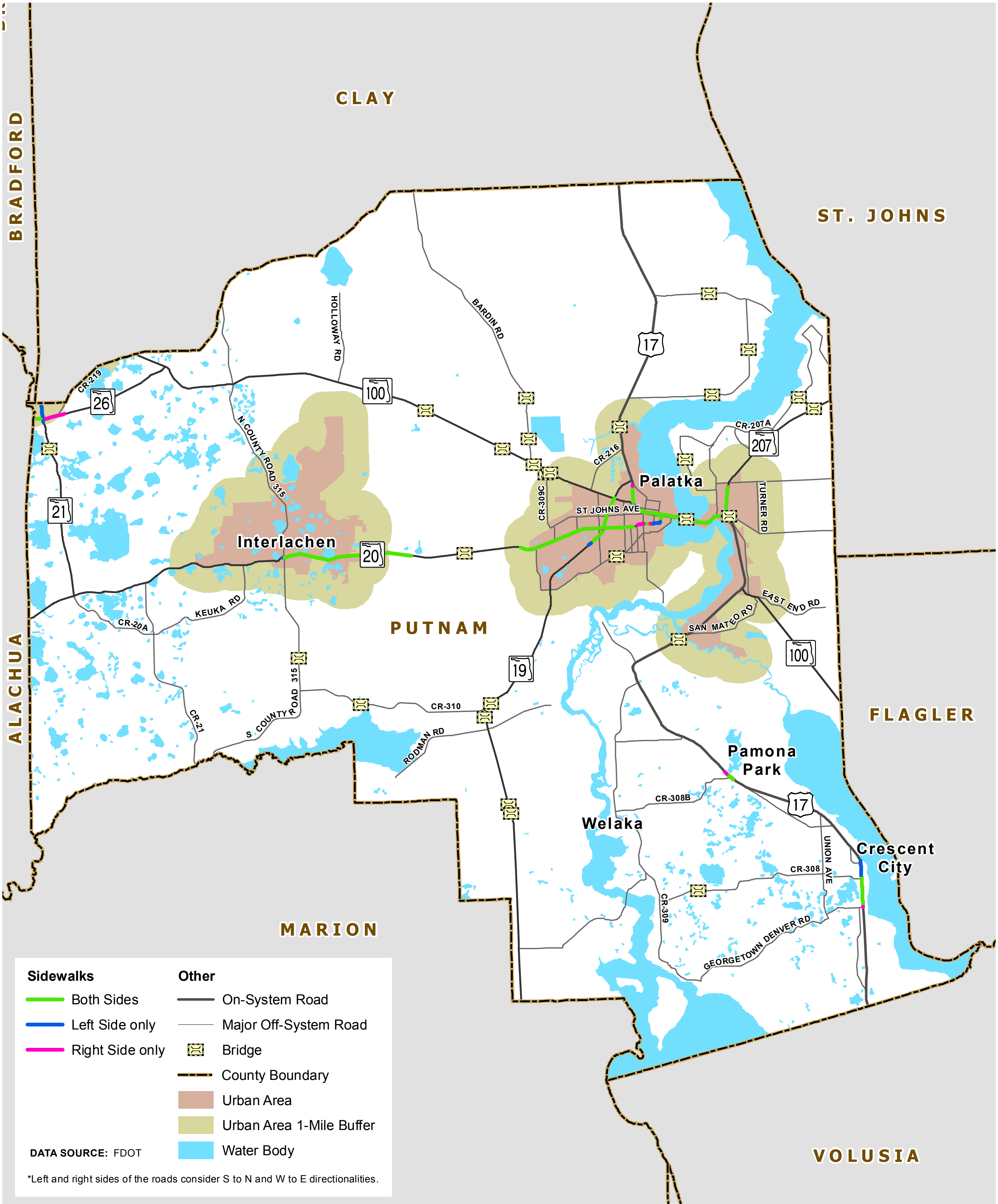

FDOT

0 3.5 7
Miles

# EXISTING PEDESTRIAN FACILITIES

## NASSAU COUNTY

FIGURE A2-13

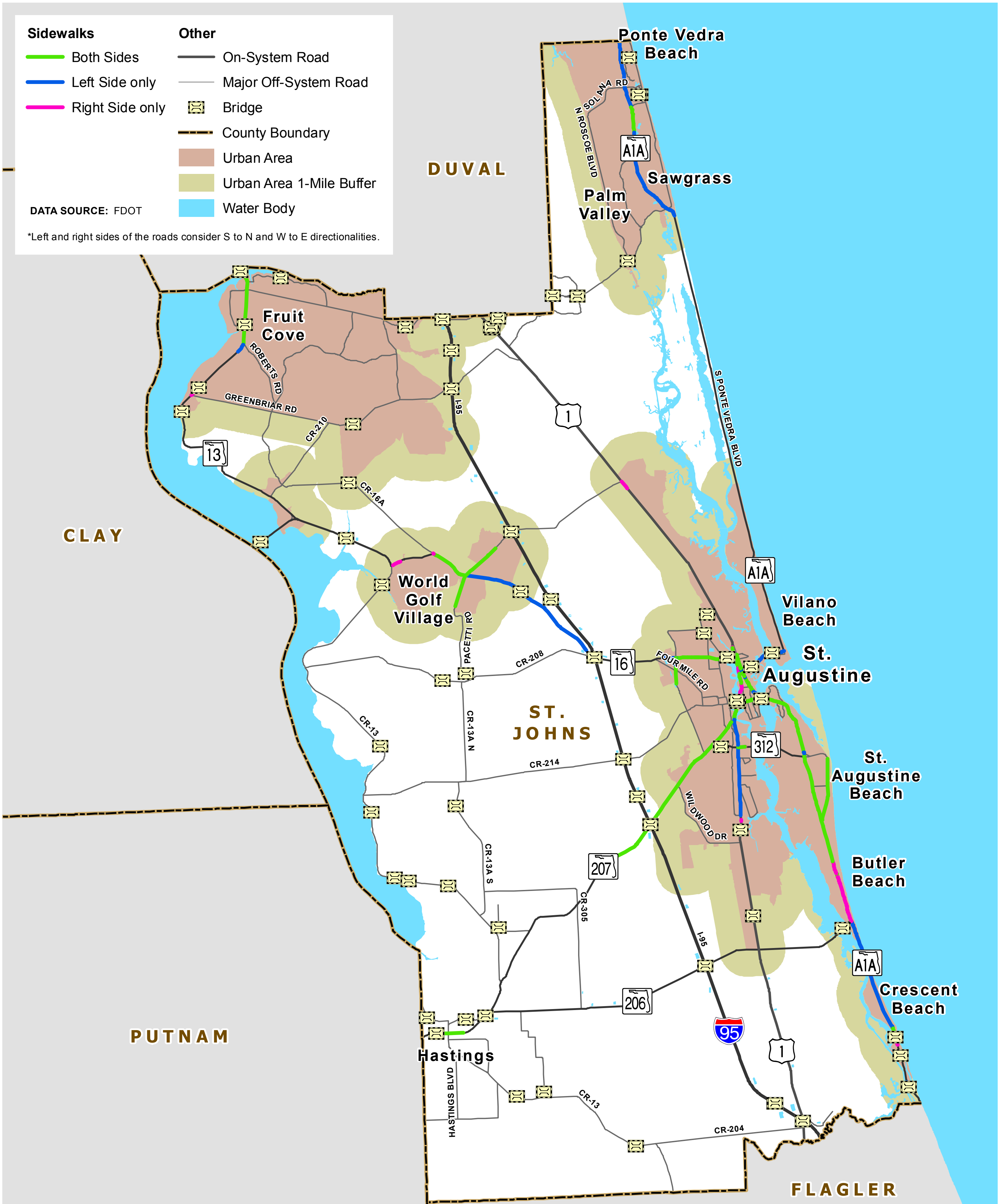



FDOT

# EXISTING PEDESTRIAN FACILITIES

## PUTNAM COUNTY

FIGURE A2-14




0 3.5 7
Miles

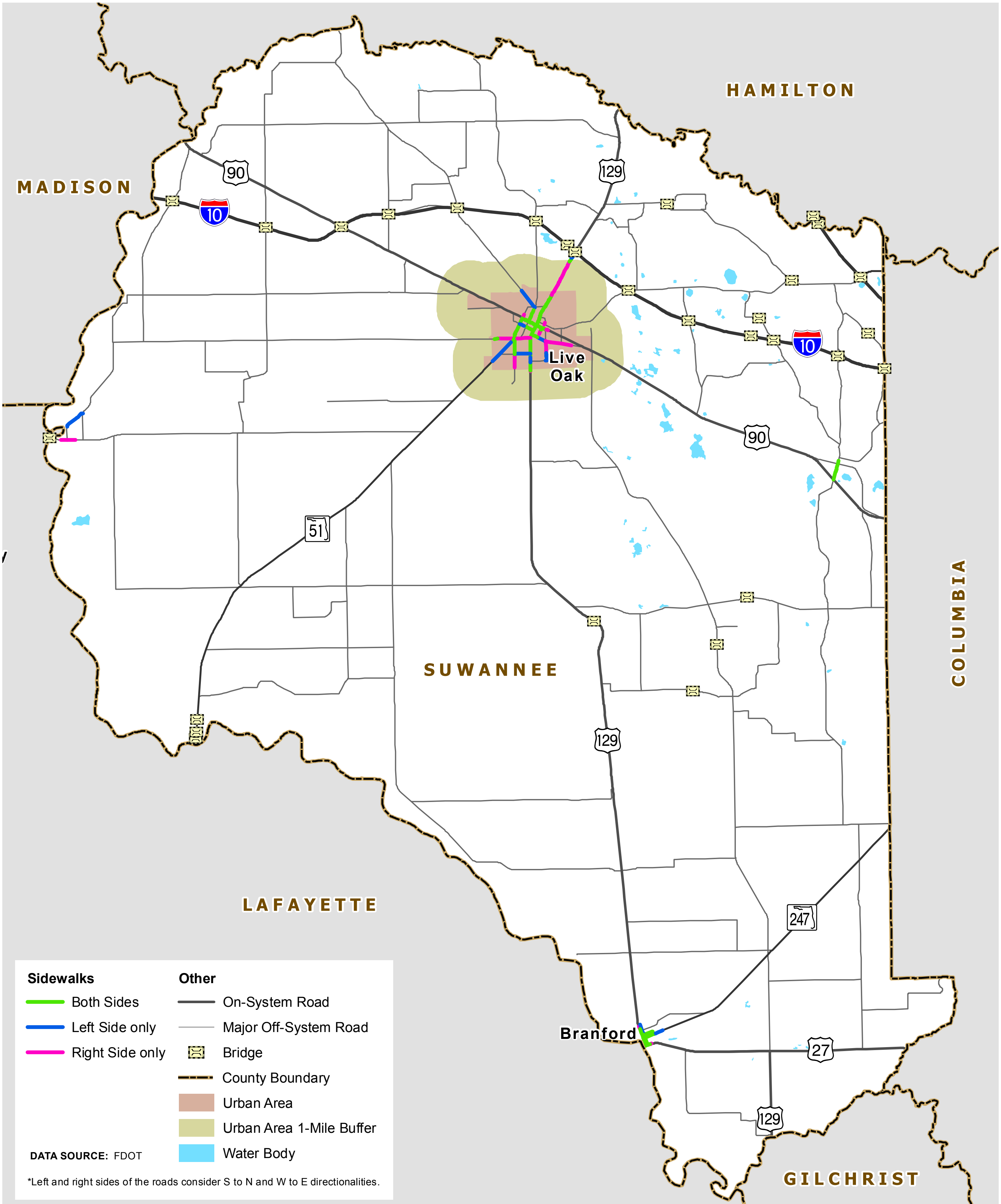
FDOT

# EXISTING PEDESTRIAN FACILITIES

## ST. JOHNS COUNTY

FIGURE A2-15

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

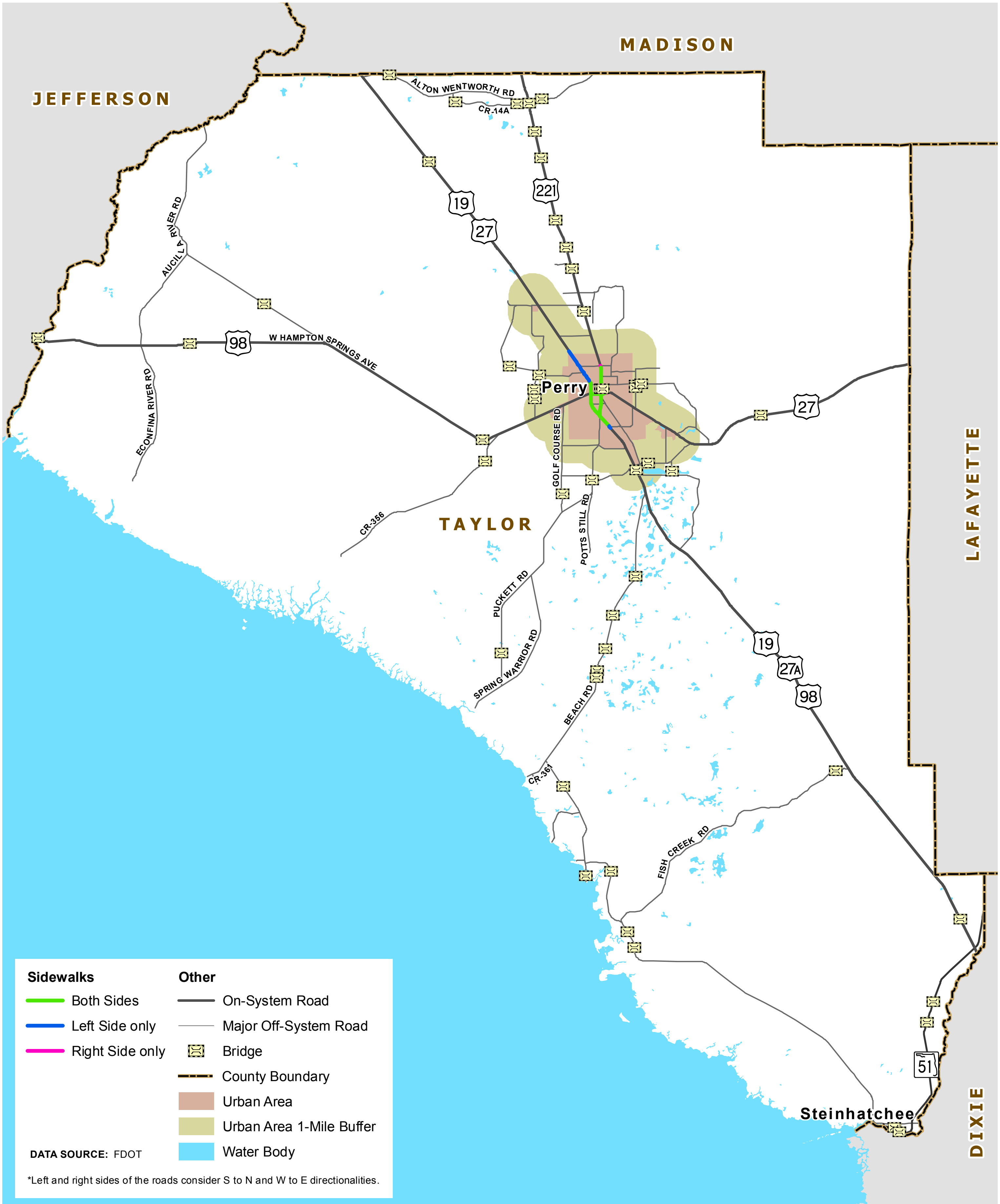



0 3 6
Miles

# EXISTING PEDESTRIAN FACILITIES

## SUWANNEE COUNTY

FIGURE A2-16

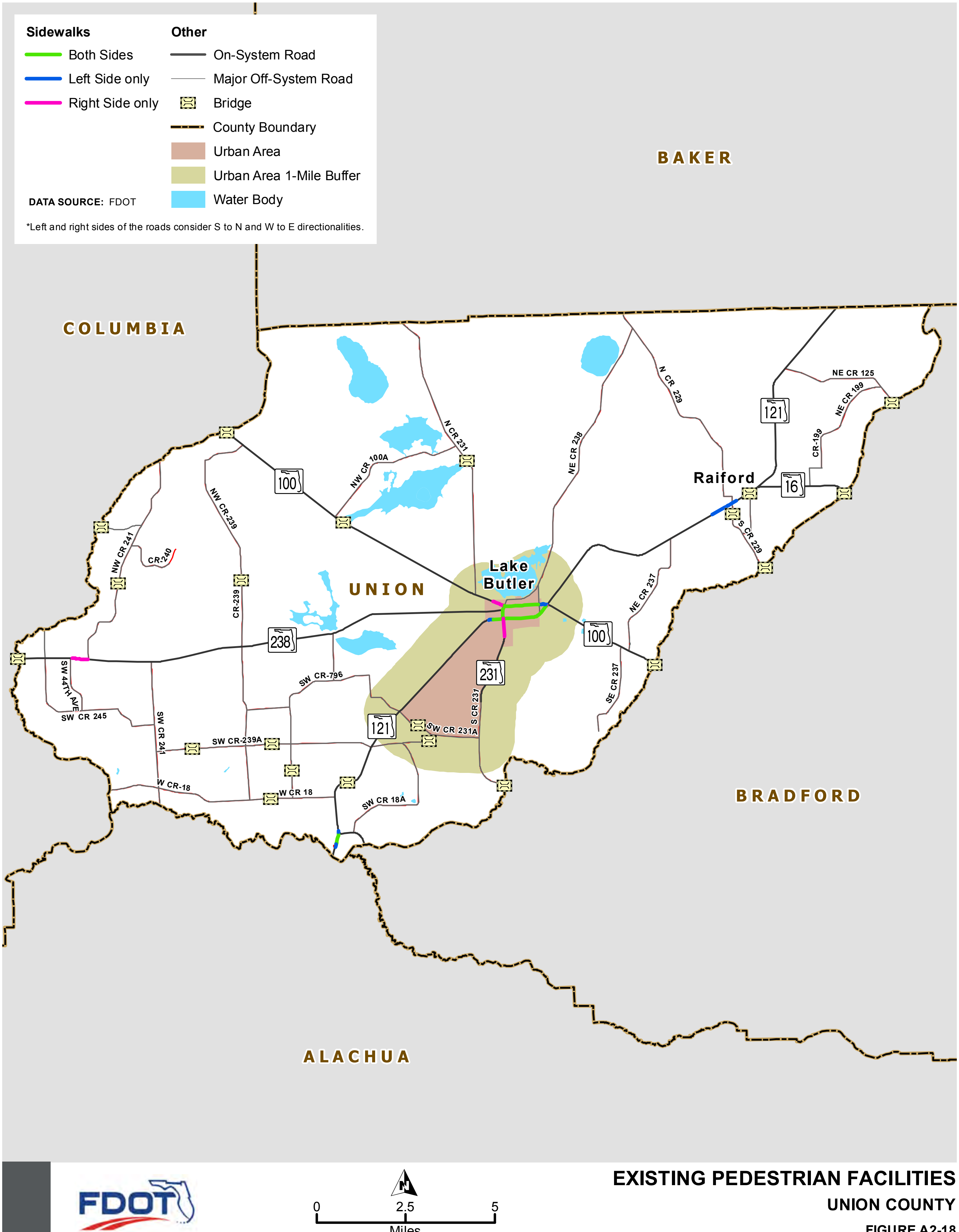



FDOT

# EXISTING PEDESTRIAN FACILITIES

## TAYLOR COUNTY

FIGURE A2-17




# EXISTING PEDESTRIAN FACILITIES
## UNION COUNTY
FIGURE A2-18

# 04

# Level of Service Analysis

# 4.0 Level of Service Analysis

Adopted in FDOT's *2013 Quality/Level of Service Handbook* and the *Highway Capacity Manual 2010,* the Bicycle and Pedestrian Level of Service Models were used to evaluate existing bicycling and walking conditions. This section provides background information, model structures, data descriptions for these evaluation tools, and results.

## 4.1 Bicycle Methodology

The Bicycle Level of Service (Bicycle LOS) Model, a bicycling conditions performance measure, is a "supply-side" criterion. It measures bicycling conditions of a roadway, which provides bicyclists' perceived safety and comfort about motor vehicle traffic and roadway conditions. This widely used and Florida Department of Transportation-adopted criterion is classified as the quality or level of service (accommodation) for bicyclists that currently exists on a roadway. One of the greatest benefits of the Bicycle LOS is that it indicates which network segments have the greatest needs. It uses the same measurable traffic and roadway factors that transportation planners and engineers use for other travel modes. With statistical precision, the Bicycle LOS Model measures bicycling suitability based on the following factors:

- Bike lane or paved shoulder width
- Outside lane width
- Traffic volume
- Traffic speed
- Traffic type
- Pavement surface condition
- Presence of on-street parking

The bicycle level of service analysis produces an objective score with corresponding letter grade, which measures bicycle accommodation on that section of roadway, as shown in **Table 3**. For example, a particular segment without any type of bicycle facility may be an LOS D based on the characteristics above. This tool determines how much accommodation benefit would be attributable to the improvements. In the above example, adding a designated bike lane to eliminate a network gap might improve the segment's level of service to LOS B. This process simply and objectively determines which facilities have the greatest suitability or compatibility for bicyclists relative to the rest of the District Two network.

**Table 3: Bicycle Level of Service Determination**

| Level of Service | Numerical Range |
|---|---|
| A | ≤ 1.5 |
| B | >1.5 and ≤ 2.5 |
| C | >2.5 and ≤ 3.5 |
| D | >3.5 and ≤ 4.5 |
| E | >4.5 and ≤ 5.5 |
| F | > 5.5 |

**Appendix D**, Technical Reference for Level of Service, contains additional information about the Bicycle Level of Service Model, including the model form and the collected data items.

### 4.1.1 Bicycle Results

Road segments within District Two counties that produced an LOS E and LOS F are listed in **Table 4** and are shown on **Figures B1-1** through **B1-18**. Level of service is evaluated separately for each side of the street; in cases where the results are different for each side, the side with the lesser level of service result is shown on the figures. Note that inclusion in **Table 4** does not suggest that the entirety of that roadway within the county has an LOS of E or F. There are a few things to keep in mind when interpreting the results in **Table 4**. First, the table only highlights roadways with poorly performing segments for bicyclists. It is not meant to imply a LOS E and F standard for state roadways. Based on the scale in **Table 3**, LOS E and F represent the most deficient facilities for bicyclists. Secondly, the bicycle level of service analysis is one component of the gap prioritization methodology, and Section 7 describes the gap prioritization and weightings in detail. Finally, the LOS E and F segments in **Table 4** only are portions of the roadways, and some segments may be extremely short and not visible at the map scale. Nevertheless, **Figures B1-1** through **B1-18** show the segments in more detail.

The Bicycle LOS Model identified less than 10 percent of the District's roads as LOS E and F. A segment with an LOS E and F means that the roadway is not conducive to bicycle travel based on the criteria listed in the methodology. From Alachua to Nassau County, U.S. 301 (S.R. 200) is LOS E and F. While it may not be accommodating of bicycles, U.S. 301 is an important Strategic Intermodal System (SIS) facility known for its large volume of heavy vehicles, which is a primary reason for the poor bicycle level of service result on this roadway.

As shown on **Figures B1-1** through **B1-18** and in **Table 4**, Gilchrist, Levy, St. Johns, and Taylor Counties did not have any LOS E and F roadways.

Table 1: LOS E and F Road Segments for Bicycles

| County | State Roads |
|---|---|
| Alachua | U.S. 301 (S.R. 200), S.R. 20*, S.R. 235*, Newberry Road (S.R. 26), and S.R. 24 |
| Baker | S.R. 2, U.S. 90 (S.R. 10), and S.R. 121 |
| Bradford | U.S. 301 (S.R. 200), West Madison Street (S.R. 100) |
| Clay | U.S. 301 (S.R. 200), Blanding Boulevard (S.R. 21), US 17 (S.R. 15), and S.R. 16 |
| Columbia | Main Boulevard/U.S. 41 (S.R. 25)*, Marion Avenue/U.S. 441 (S.R. 47), and U.S. 90 (S.R. 10)* |
| Dixie | U.S. 19/27A/98 (S.R. 55)* |
| Duval | U.S. 301 (S.R. 200), Beaver Street/U.S. 90 (S.R. 10), Edgewood Avenue (S.R. 111), MLK Jr. Parkway/U.S. 1 Alt. (S.R. 115/S.R. 15/S.R. 115A), Hart Expressway (S.R. 228), Arlington Expressway (S.R. 10A), Phillips Highway (S.R. 5), State Street (S.R. 139), 3rd Street (S.R. A1A), San Jose Boulevard (S.R. 13), 103rd Street (S.R. 134), U.S. 17 (S.R. 15)*, and Lem Turner Road (S.R. 115) |
| Gilchrist | None |
| Hamilton | U.S. 129 (S.R. 6/25/51/100), S.R. 6, Old U.S. 41 (S.R. 25), and U.S. 41 (S.R. 25) |
| Lafayette | North Fletcher Avenue (S.R. 51) and U.S. 27 (S.R. 20) |
| Levy | None |
| Madison | NE Colin Kelly Highway (S.R. 145)* |
| Nassau | U.S. 301 (S.R. 200) and U.S. 1/23/301 (S.R. 15) |
| Putnam | Reid Street (S.R. 100)* |
| St. Johns | None |
| Suwannee | Ohio Avenue (S.R. 249)* |
| Taylor | None |
| Union | S.R. 100* |

*Extremely short segments may not be visible at map scale.

## 4.2 Pedestrian Methodology

Similarly, the pedestrian level of service evaluates pedestrians' perceived safety about motor vehicle traffic. It identifies the quality of service for pedestrians within the roadway environment and measures facility needs within the region's roadway network. The Pedestrian Level of Service (Pedestrian LOS) Model evaluates walking conditions. This model is the most accurate method of evaluating the walking conditions within shared roadway environments. It uses the same measurable traffic and roadway factors that transportation planners and engineers use for other travel modes. As the Bicycle LOS Model does for the bicycle mode, the Pedestrian LOS Model assesses walking conditions based on the following roadway characteristics:

- Presence of a sidewalk (if a shared use path is present within the right-of-way, it is also considered)
- Lateral separation between pedestrians and motor vehicle traffic (including outside lane width, paved shoulder width, buffer area width, and sidewalk width)
- Traffic volume
- Traffic speed
- Presence of on-street parking

Planners and engineers nationwide use the Pedestrian LOS Model, which uses the same numerical scale as the Bicycle LOS Model, in many planning and design applications. The Pedestrian LOS Model can be used to compare benefits among proposed sidewalk/roadway cross sections, to identify roadways that are candidates for reconfiguration for sidewalk improvements, and to prioritize and program roadways for sidewalk improvements. As with the Bicycle LOS Model, it clearly demonstrates the suitability or compatibility for pedestrians on District Two roadways.

**Appendix D**, Technical Reference for Level of Service, contains additional information about the Pedestrian Level of Service Model, including the model form and the collected data items.

### 4.2.1 Pedestrian Results

Road segments within District Two counties that produced an LOS E and F are listed in **Table 5** and are shown on **Figures B2-1** through **B2-18**. Note that LOS is evaluated separately for each side of the street; in cases where the LOS result is different for the two sides, the worse of the two results is shown in the figures. Also note that inclusion in **Table 4** does not suggest that the entirety of that roadway within the county has an LOS of E or F. There are a few things to keep in mind when interpreting the results in **Table 5**. First, the table only highlights roadways with poorly performing segments for pedestrians. It is not meant to imply a LOS E and F standard for state roadways. Based on the scale in **Table 3**, LOS E and F were chosen to represent the most deficient facilities for pedestrians. Secondly, the pedestrian level of service analysis is one component of the gap prioritization methodology, and Section 7 describes the gap prioritization and weightings in detail. Finally, the LOS E and F segments in **Table 5** only are portions of the roadways, and some segments may be extremely short and not visible at the map scale. Nevertheless, **Figures B2-1** through **B2-18** show the segments in more detail.

The Pedestrian LOS Model also identified about 52 percent of the District's roads as LOS E and F. A segment with an LOS E and F means that the roadway is not favorable to pedestrian conditions based on the criteria listed in the methodology.

**Tables 4** and **5** show segments where either the bicycle or pedestrian level of service was an E or F. **Table 6** shows segments where both the bicycle and pedestrian level of service was an LOS E. There were no LOS F segments for both bicycle and pedestrian.

### Table 2: LOS E and F Road Segments for Pedestrians

| County | State Roads |
|---|---|
| Alachua | U.S. 301 (S.R. 200), Newberry Road (S.R. 26), Archer Road (S.R. 24), U.S. 27 (S.R. 45), 39th Avenue (S.R. 222), Williston Road (S.R. 121), Hawthorne Road (S.R. 20) 2nd Avenue (S.R. 26A), and U.S. 441 (S.R. 20/25) |
| Baker | U.S. 90 (S.R. 10), S.R. 121, South 5th Street (S.R. 228), and S.R. 2 |
| Bradford | U.S. 301 (S.R. 200), West Madison Street (S.R. 100), S.R. 230*, S.R. 18, S.R. 21, and East Brownlee Street (S.R. 16) |
| Clay | U.S. 17 (S.R. 15), S.R. 16, Blanding Boulevard (S.R. 21), U.S. 301 (S.R. 200), S.R. 100, and Branan Field Road (S.R. 23) |
| Columbia | U.S. 90 (S.R. 10) , U.S. 41 (S.R. 25/100), U.S. 441/Marion Street South (S.R. 25A/47), U.S. 27 (S.R. 20), Branford Road (S.R. 247), and S.R. 47 |
| Duval | Airport Road (S.R. 102), Dunn Avenue (S.R. 104), Zoo Parkway/Heckscher Drive (S.R. 105), MLK Jr. Parkway/U.S. 1 Alt. (S.R. 115), Beaver Street/U.S. 90 (S.R. 10), Arlington Expressway (S.R. 10A), Southside Boulevard (S.R. 115), Philips Highway (S.R. 5), Hart Expressway (S.R. 228), Roosevelt Boulevard/U.S. 17 (S.R. 15), Blanding Boulevard (S.R. 21), Normandy Boulevard (S.R. 228), Edgewood Avenue (S.R. 111), New Kings Road/US 1 (S.R. 15), Atlantic Boulevard (S.R. 10), 3rd Street (S.R. A1A), Beach Boulevard (S.R. 212), Emerson Street (S.R. 126), University Boulevard (S.R. 109), Baymeadows Road (S.R. 152), Branan Field Road (S.R. 23), Mayport Road (S.R. 101), Lane Avenue (S.R. 103), 8th Street (S.R. 114), Haines Street Expressway/MLK Jr. Parkway (S.R. 115A), S.R. 116, Brentwood/Norwood Avenue (S.R. 117), San Juan Avenue (S.R. 128), 103rd Street (S.R. 134), Union/State Street (S.R. 139), U.S. 301 (S.R. 200), Wilson Boulevard (S.R. 208), Riverside/St. Johns Avenue (S.R. 211), 3rd Street (S.R. A1A), and San Jose Boulevard (S.R. 13) |
| Gilchrist | S.R. 26, S.R. 47*, and Main Street/U.S. 129 (S.R 49) |
| Hamilton | U.S. 129 (S.R. 6/25/51/100) and U.S. 41 (S.R. 25) |
| Lafayette | U.S. 27 (S.R. 20) and Fletcher Street (S.R. 51) |
| Levy | U.S. 27 (S.R. 500), S.R. 24, U.S. 41/SW 7th Street (S.R. 45), U.S. 129 (S.R. 49), U.S. 27/NE 6th Boulevard (S.R. 121), NW 100th Street (S.R. 345), and U.S. 19 (S.R. 55) |
| Madison | U.S. 90 (S.R. 10), S.R. 6*, US 19/27 (S.R. 20), S.R 53*, U.S. 221 (S.R. 55), S.R. 145, and NE Colin Kelly Highway (S.R. 145) |
| Nassau | U.S. 1/23/301 (S.R. 15/200), U.S. 17 (S.R. 5), U.S. 90 (S.R. 10), Lem Turner Road (S.R. 115), and S.R. A1A |
| Putnam | U.S. 17 (S.R. 15), S.R. 19, S.R. 21, Reid Street (S.R. 100)*, S.R. 207, and Crill Avenue (S.R. 20) |
| St. Johns | S.R. 13, S.R. 207, S.R. 312, Ponce de Leon Boulevard/ U.S. 1 (S.R. 5), S.R. 16, S.R. 5A, and S.R. A1A |
| Suwannee | Ohio Avenue (S.R. 249), U.S. 90 (S.R. 10), U.S. 27 (S.R. 20), U.S. 129 (S.R. 49/51), and Branford Road (S.R. 247) |
| Taylor | U.S. 19 (S.R. 55), U.S. 27 (S.R. 20), and U.S. 98 (S.R. 30) |
| Union | S.R. 16*, S.R. 231, S.R. 100 and S.R. 121 |

*Extremely short segments may not be visible at map scale.

**Table 3: LOS E Road Segments for Bicycles and Pedestrians**

| County | State Roads |
|---|---|
| Alachua | U.S. 301 (S.R. 200), S.R. 20*, S.R. 24, S.R. 26, |
| Baker | U.S. 90 (S.R. 10) |
| Bradford | U.S. 301 (S.R. 200) and S.R. 100* |
| Clay | Blanding Boulevard (S.R. 21), U.S. 301 (S.R. 200), and U.S. 17 (S.R. 15) |
| Columbia | U.S. 90 (S.R. 10)*, U.S. 441/Marion Street South (S.R. 25A) |
| Dixie | U.S. 19/27A/98 (S.R. 55) |
| Duval | Beaver Street/U.S. 90 (S.R. 10), MLK Jr. Parkway/U.S. 1 Alt (S.R. 15), Phillips Highway (S.R. 5)*, Lem Turner Road (S.R. 115), Edgewood Avenue (S.R. 111), Heckscher Drive (S.R. 105)*, San Jose Boulevard (S.R. 13)*, State Street (S.R. 139), and Hart Expressway (S.R. 228) |
| Hamilton | U.S. 41 (S.R. 6/25)* and U.S. 129 (S.R. 51) |
| Lafayette | U.S. 27 (S.R. 20)* |
| Madison | NE Colin Kelly Highway (S.R. 145)* |
| Nassau | U.S. 301 (S.R. 200) and U.S. 1/23/301 (S.R. 15) |
| Putnam | Reid Street (S.R. 100)* |
| Suwannee | Ohio Avenue (S.R. 249) |
| Union | S.R. 100* |

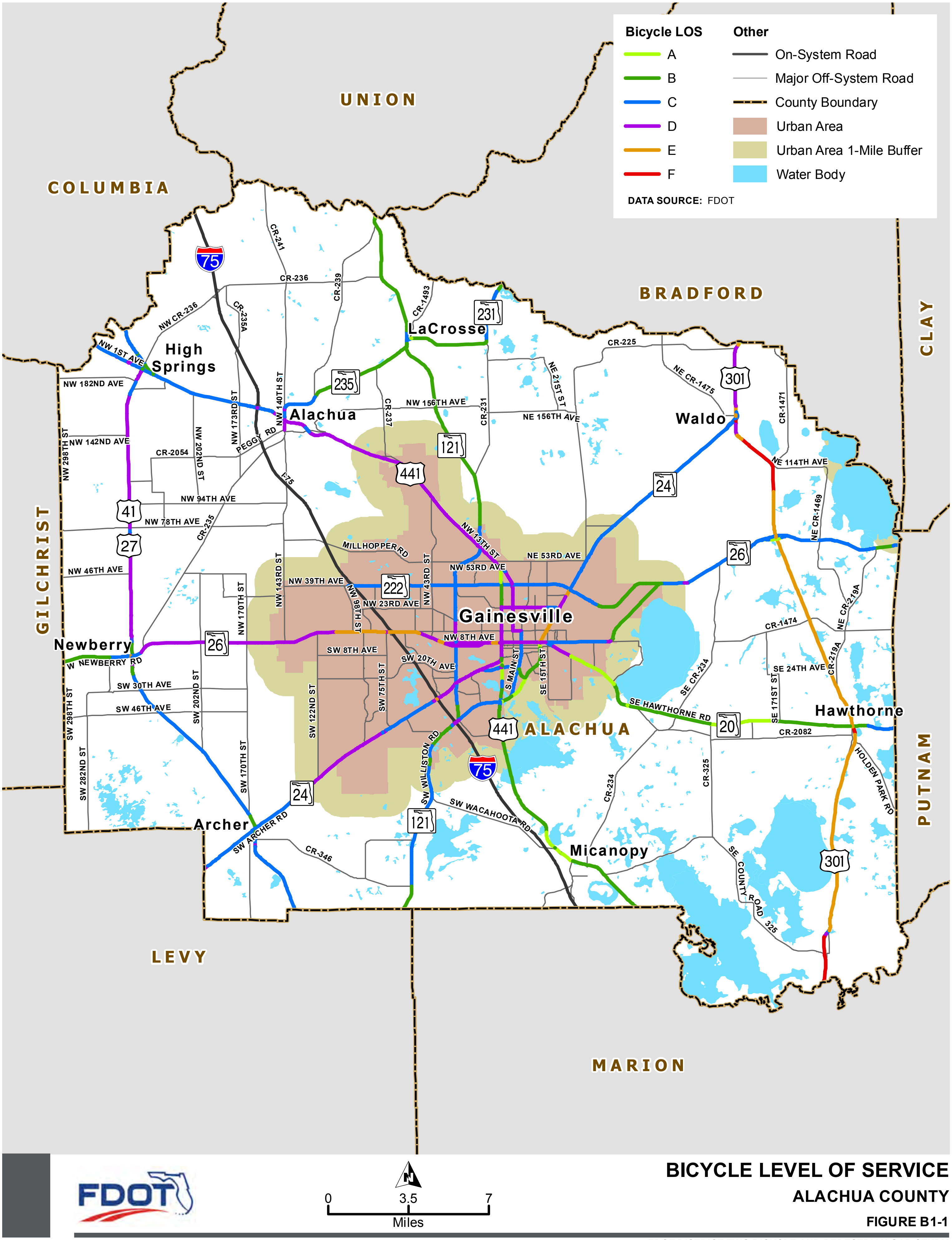
*Extremely short segments may not be visible at map scale.

## 4.3 Level of Service Data Source

In 2013, FDOT Central Office funded a project to evaluate bicycle and pedestrian level of service across the state highway system. All roadway geometric data were collected via FDOT's Video Logs and Roadway Characteristics Inventory (RCI) database. Daily traffic volumes and truck percentages were taken from FDOT's Traffic Information database.[2] For locations with on-street parking, the parking utilization percentage was assumed based on area type (urban, transitioning, or rural).[3] Quality checks of the Central Office data uncovered minor discrepancies that were addressed through updates to the programmed calculations. Furthermore, because the Central Office data were collected more than a year before this District Two study, District maintenance staff identified approximately 30 recently constructed bicycle and pedestrian facilities. The characteristics for these facilities were added to the database and the levels of service were then updated. Some isolated atypical cross sections and lane configurations (e.g., buffered bike lanes, underutilized on-street parking in small urban areas, and hatched shoulders through interchanges) represent settings that are limitations of the level of service models and may produce non-intuitive results.

[2] To estimate peak hour truck percentages, one-third of the $T_{24}$ (daily truck percentage) values was used. FDOT Transportation Statistics Office decided on this value for the *Bicycle and Pedestrian Level of Service Evaluation Report* (February 2014), and Sprinkle Consulting deemed it appropriate for District Two.

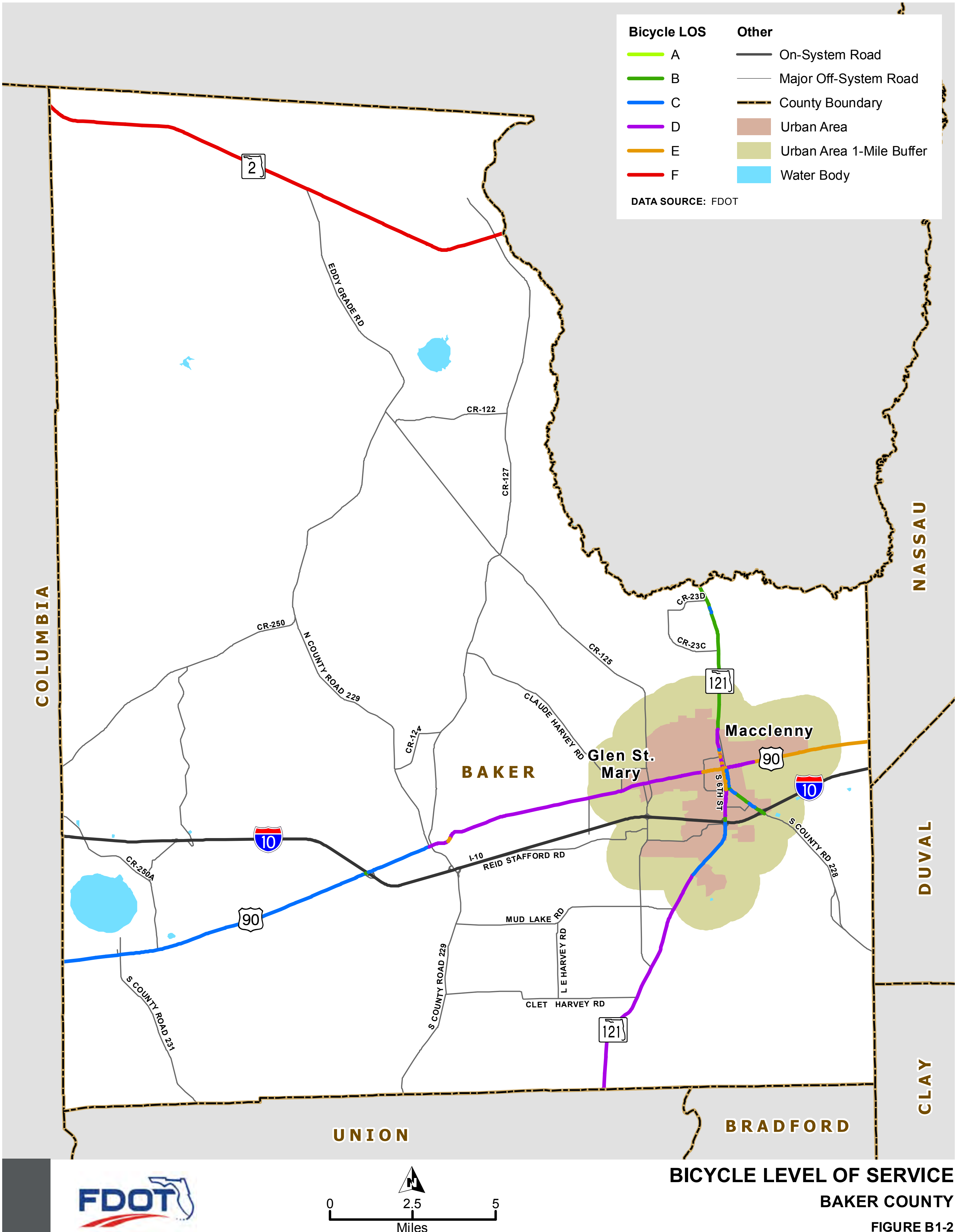
[3] For this District Two study, default percentages were increased to better reflect local conditions.




# BICYCLE LEVEL OF SERVICE

## ALACHUA COUNTY

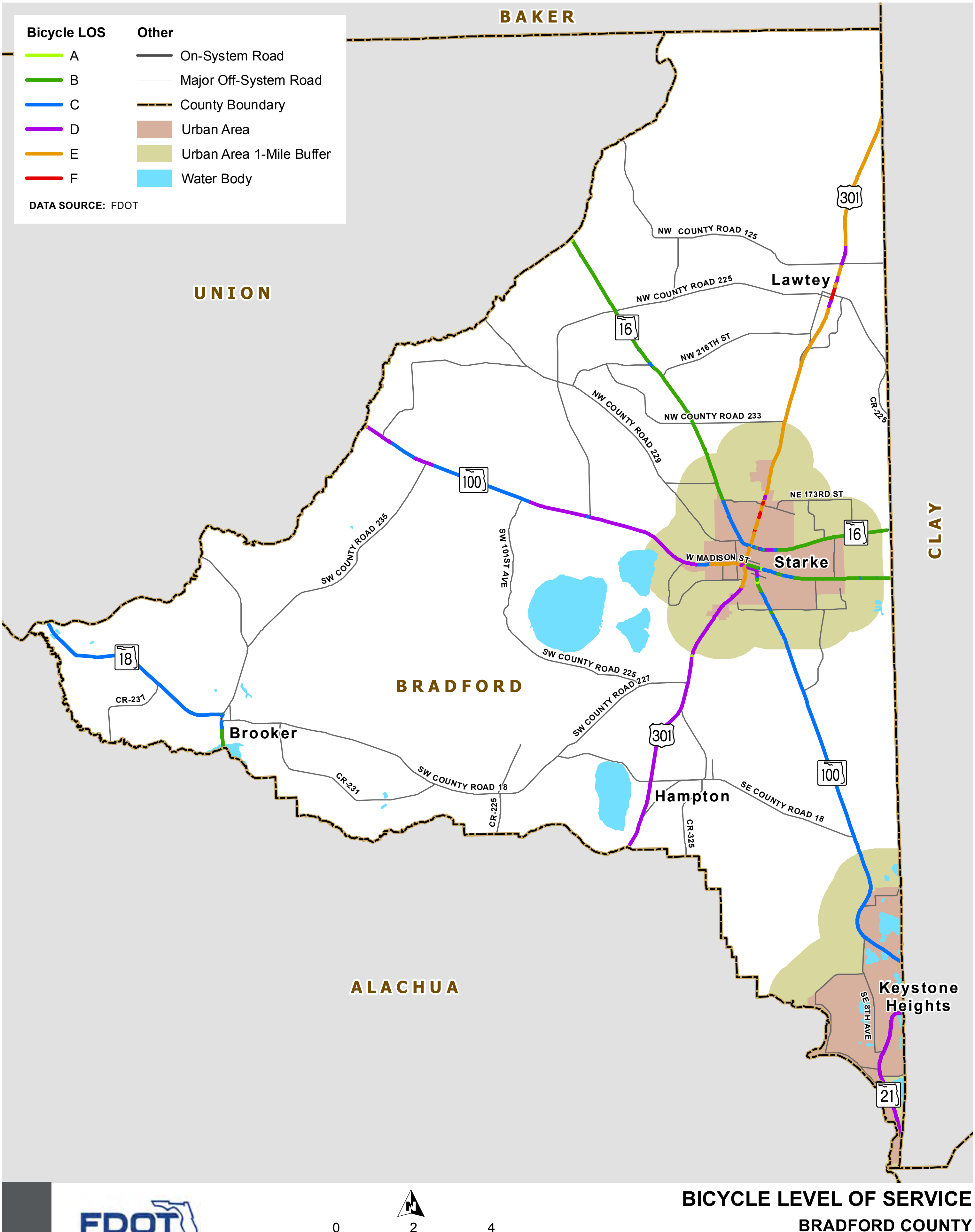
**FIGURE B1-1**




# BICYCLE LEVEL OF SERVICE

## BAKER COUNTY

FIGURE B1-2

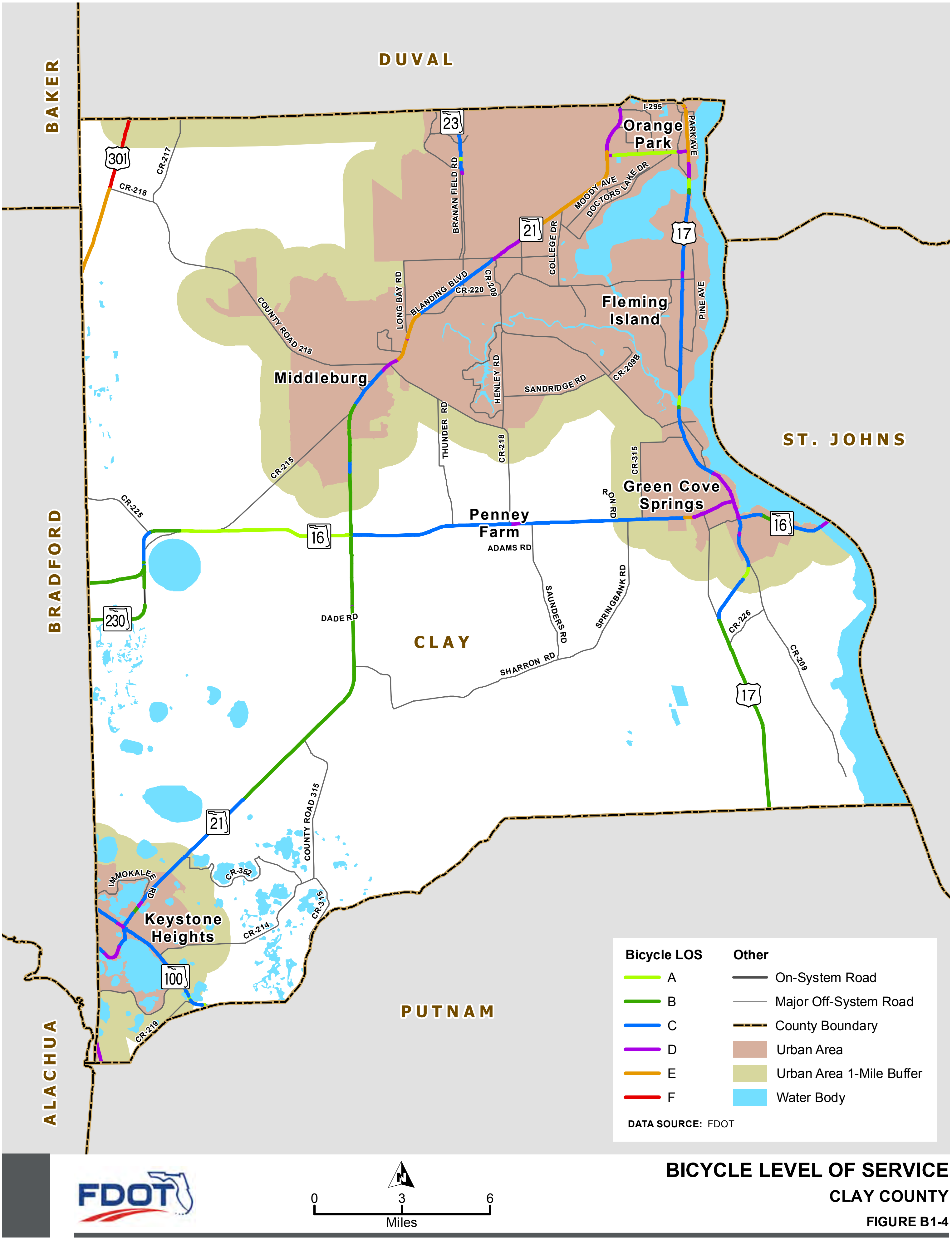



BICYCLE LEVEL OF SERVICE

BRADFORD COUNTY

FIGURE B1-3

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

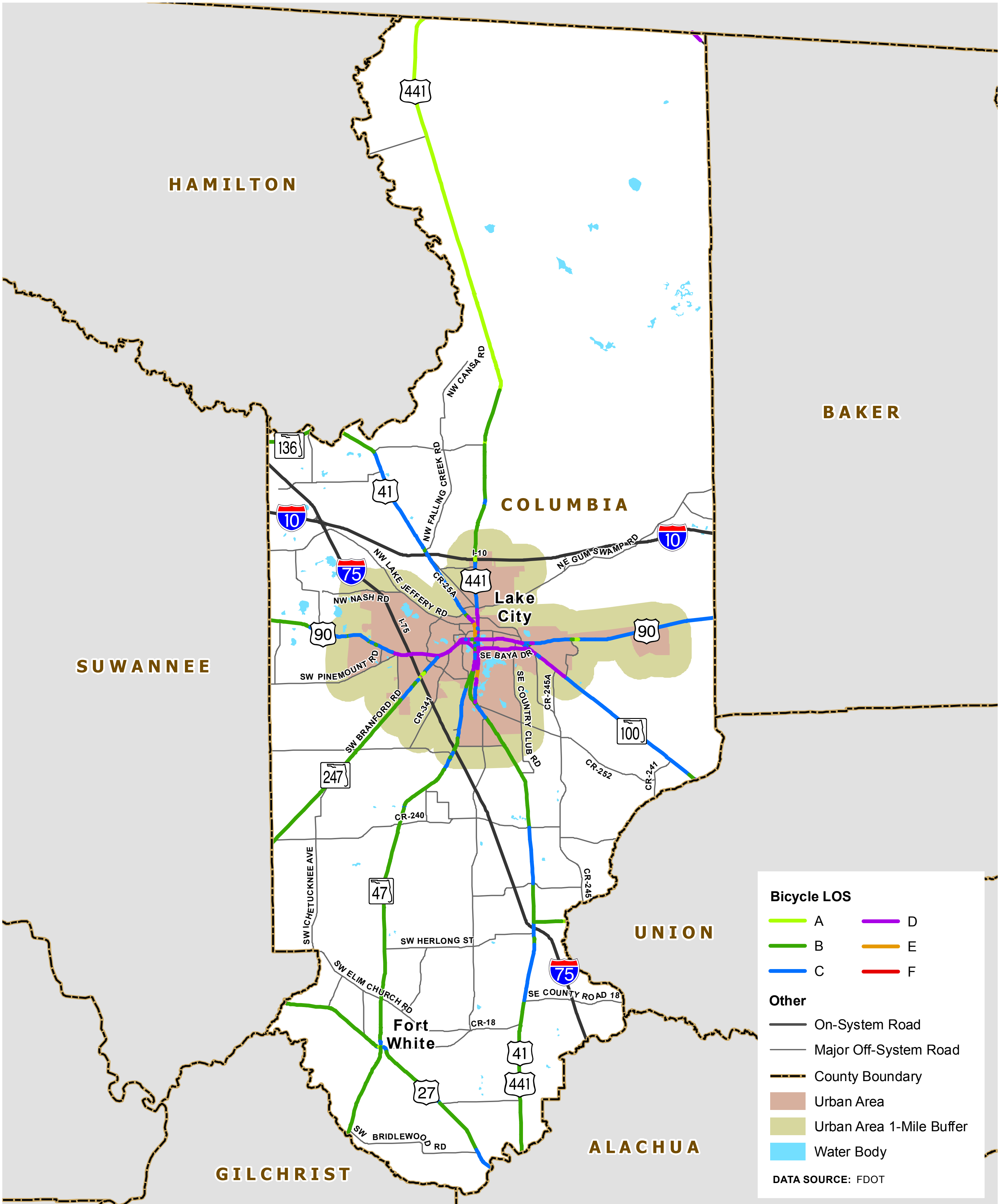



# BICYCLE LEVEL OF SERVICE

## CLAY COUNTY

FIGURE B1-4

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

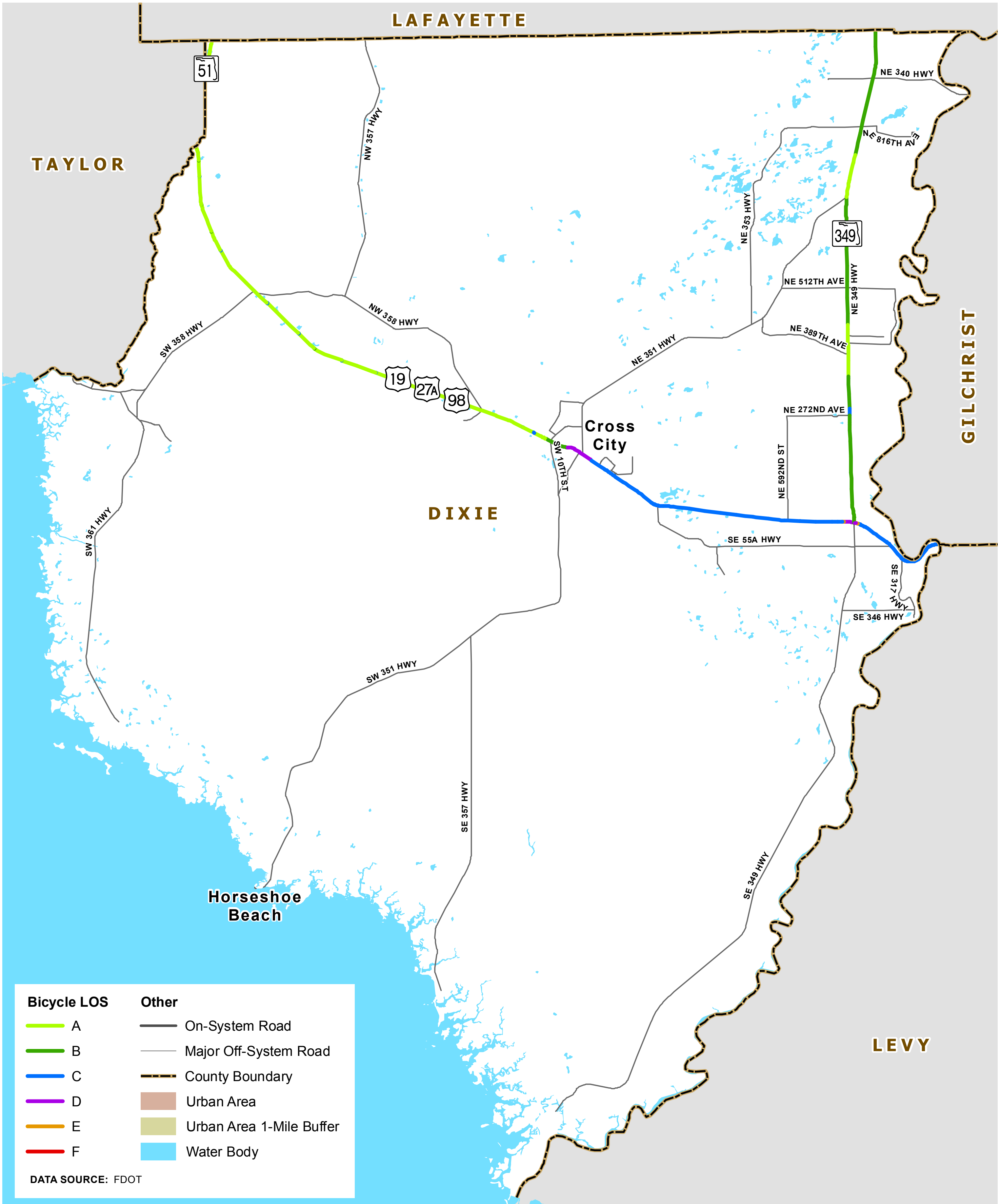



FDOT

**BICYCLE LEVEL OF SERVICE**

**COLUMBIA COUNTY**

**FIGURE B1-5**

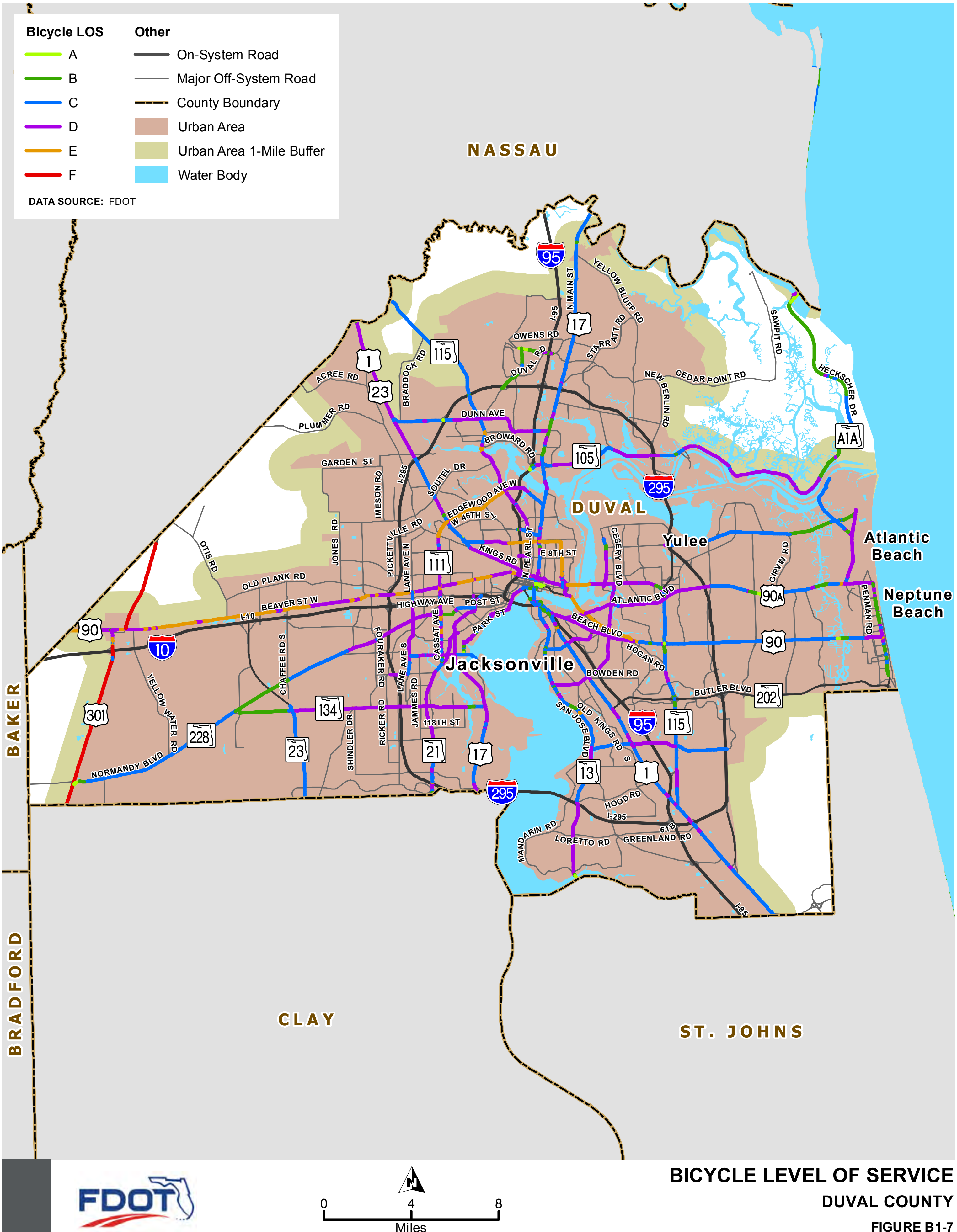



FDOT

# BICYCLE LEVEL OF SERVICE

## DIXIE COUNTY

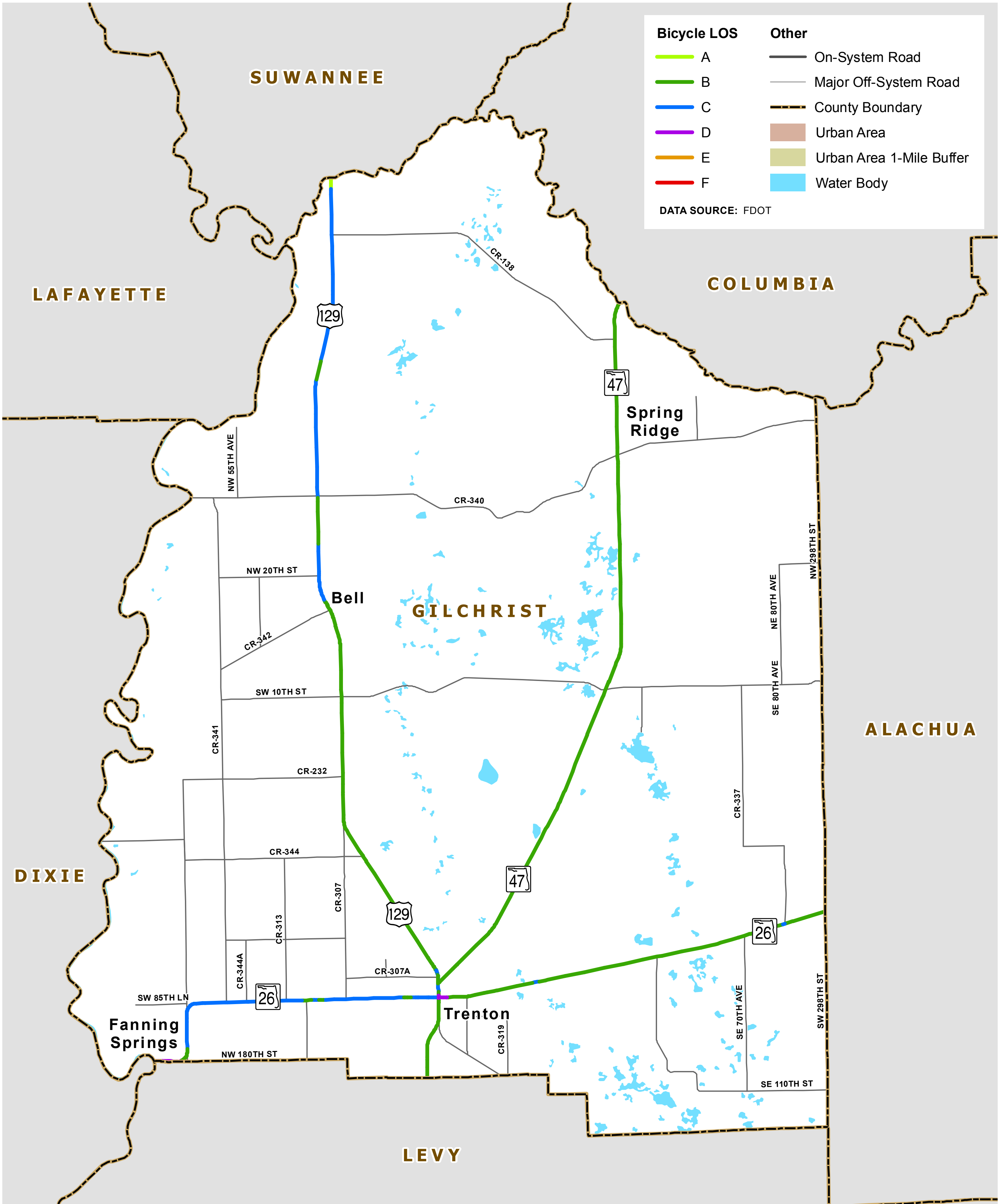
FIGURE B1-6

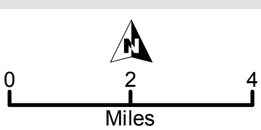



# BICYCLE LEVEL OF SERVICE

## DUVAL COUNTY

**FIGURE B1-7**



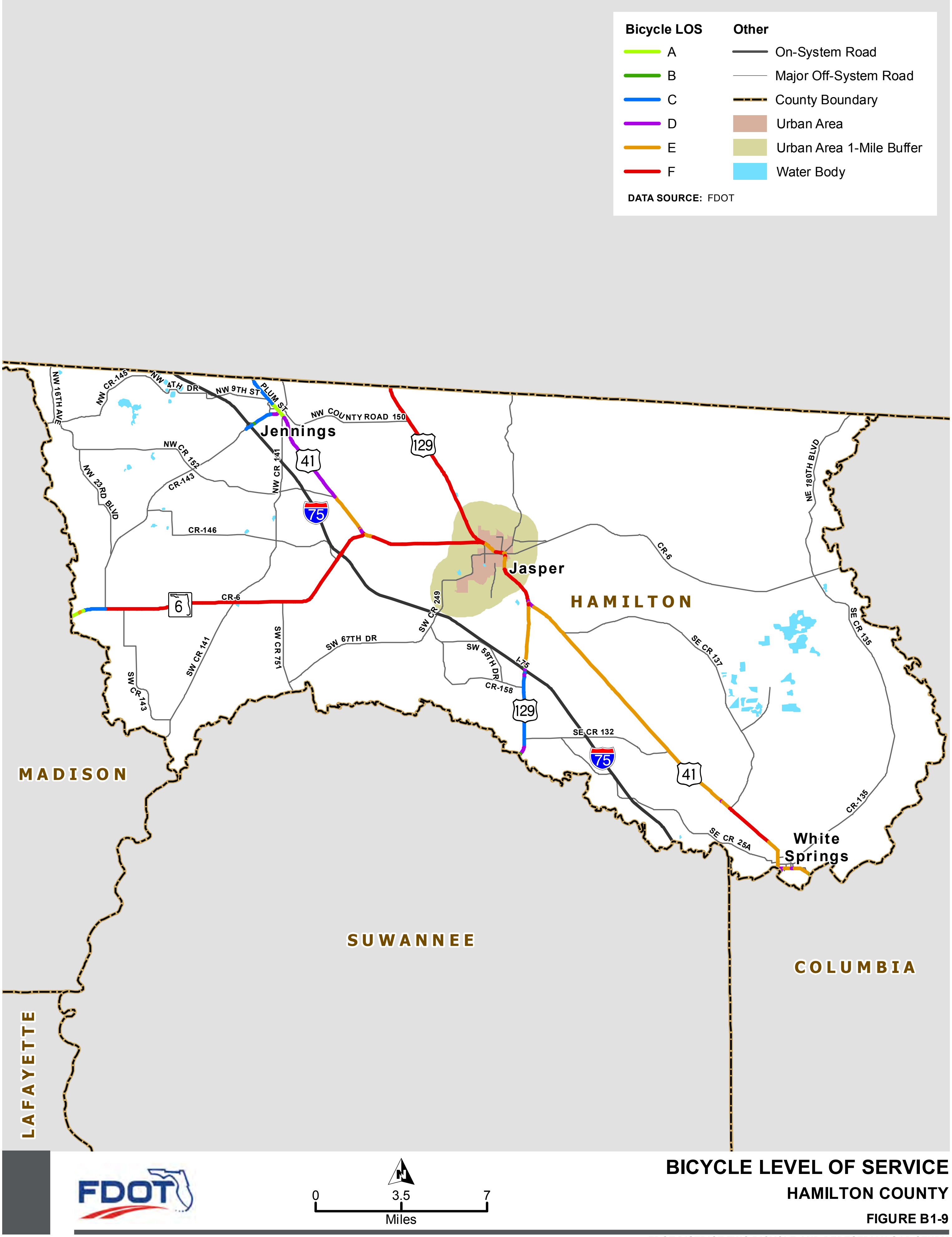




# BICYCLE LEVEL OF SERVICE

## GILCHRIST COUNTY

**FIGURE B1-8**

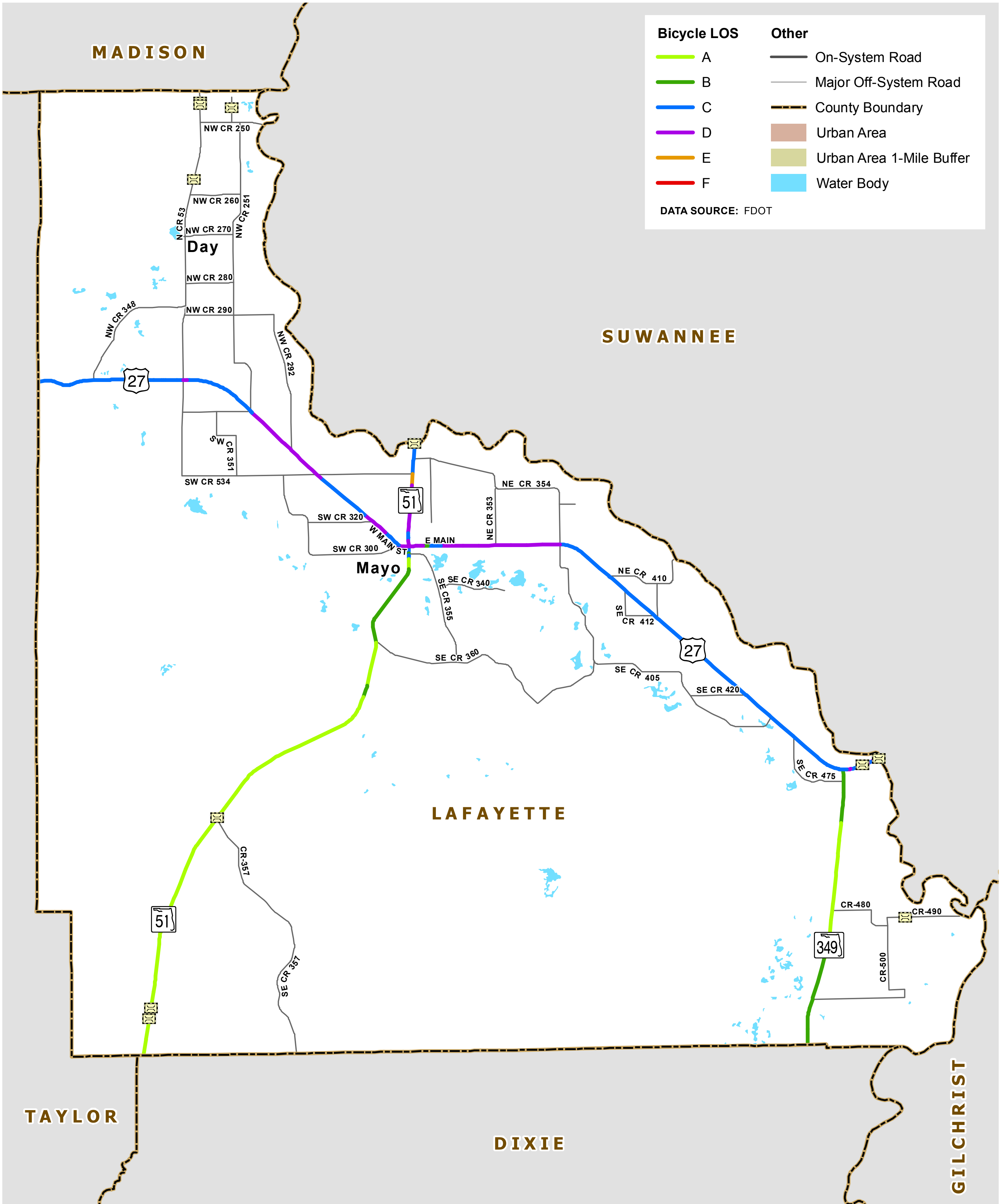
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# BICYCLE LEVEL OF SERVICE

## HAMILTON COUNTY

FIGURE B1-9



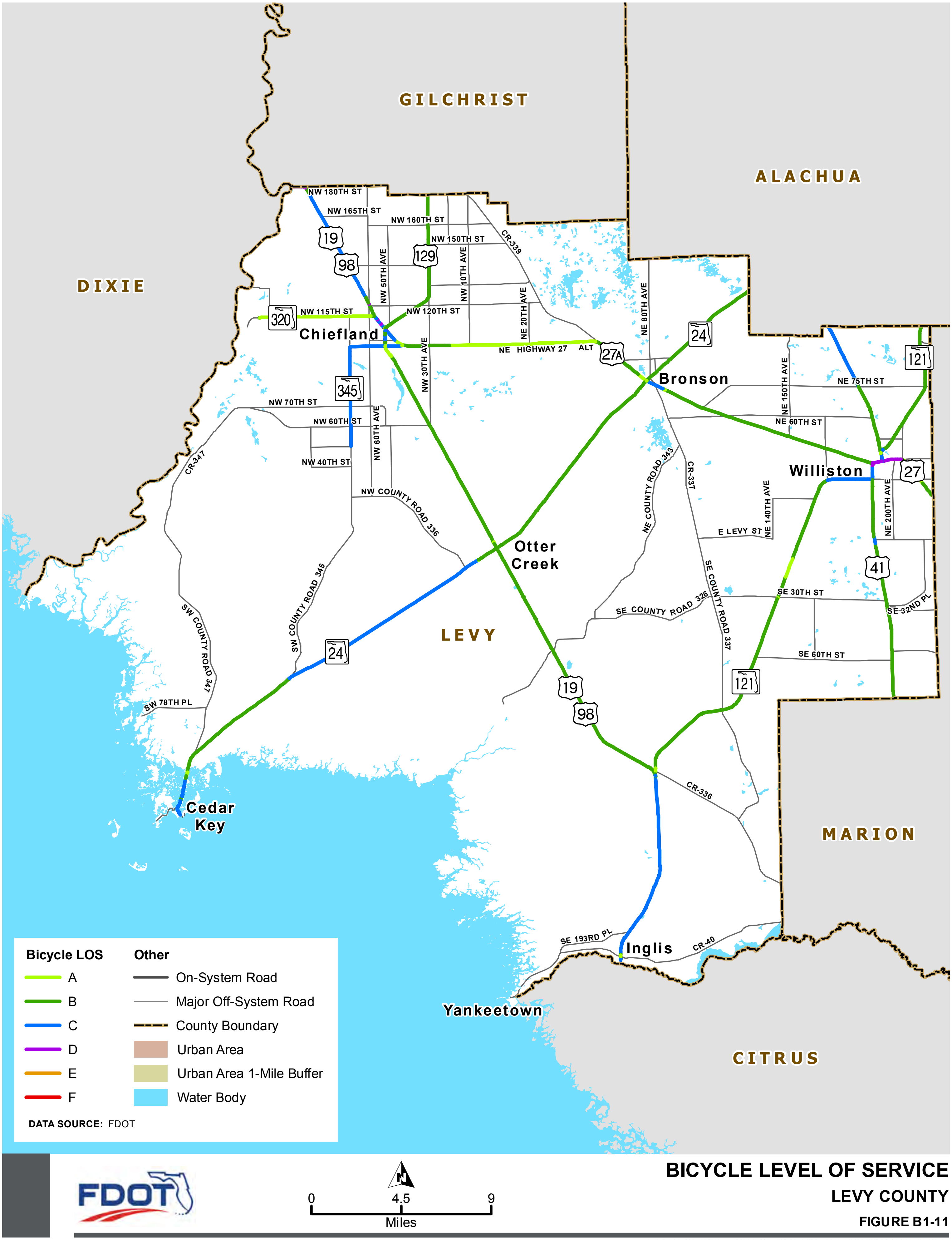

0 2.5 5
Miles

# BICYCLE LEVEL OF SERVICE

## LAFAYETTE COUNTY

**FIGURE B1-10**

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

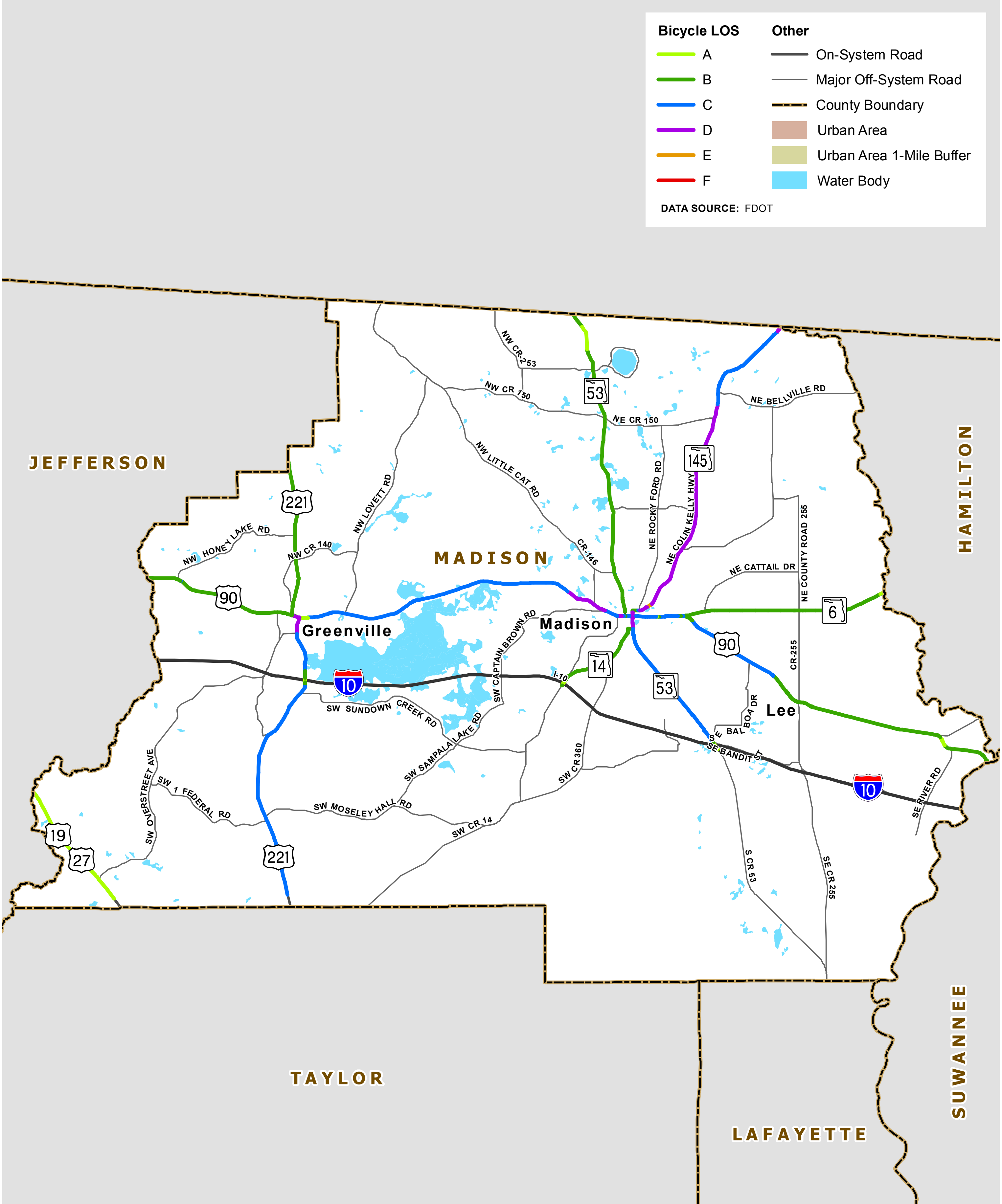



FDOT

# BICYCLE LEVEL OF SERVICE

## LEVY COUNTY

**FIGURE B1-11**

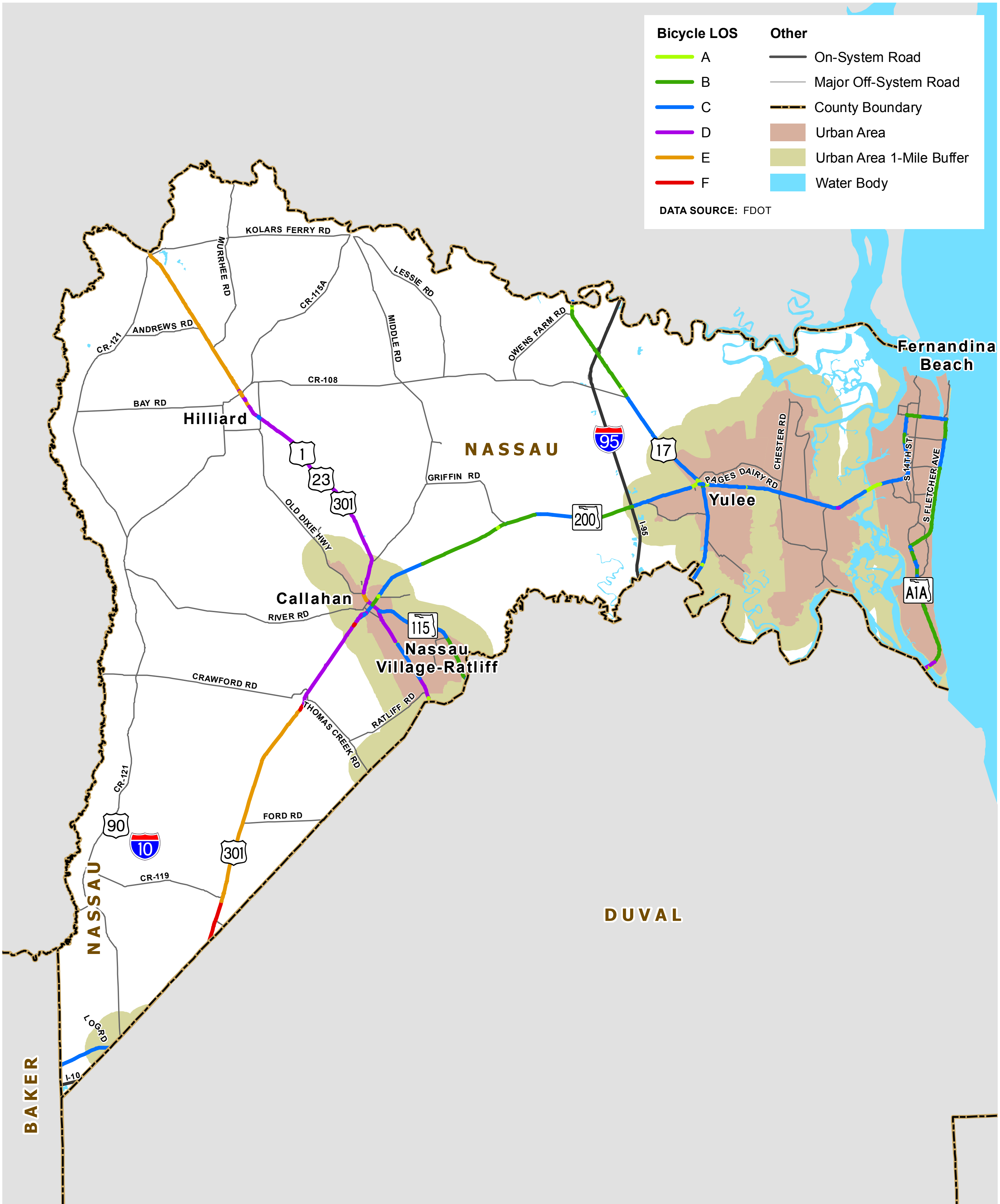



# BICYCLE LEVEL OF SERVICE

## MADISON COUNTY

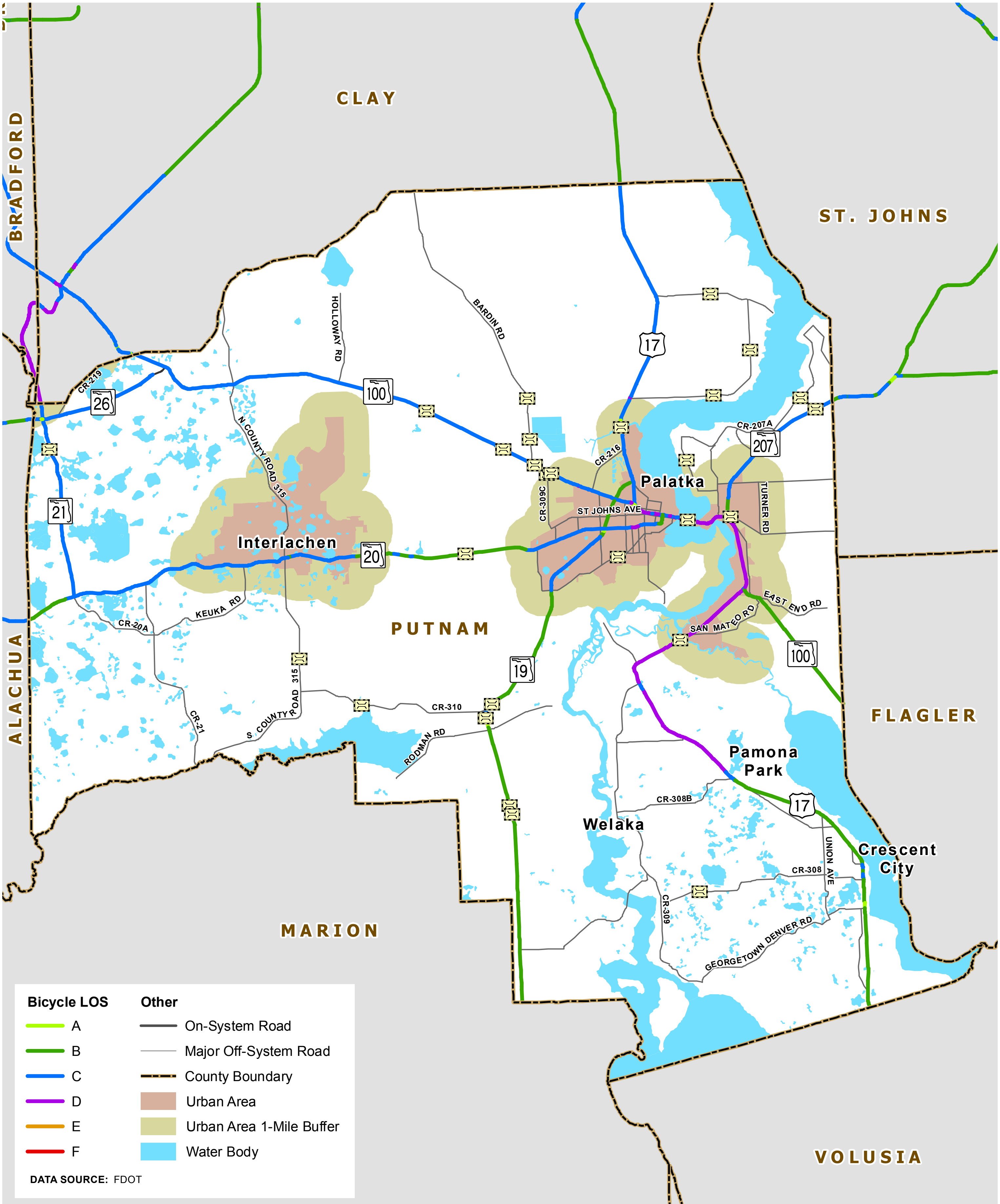
FIGURE B1-12

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# BICYCLE LEVEL OF SERVICE
## NASSAU COUNTY
**FIGURE B1-13**

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

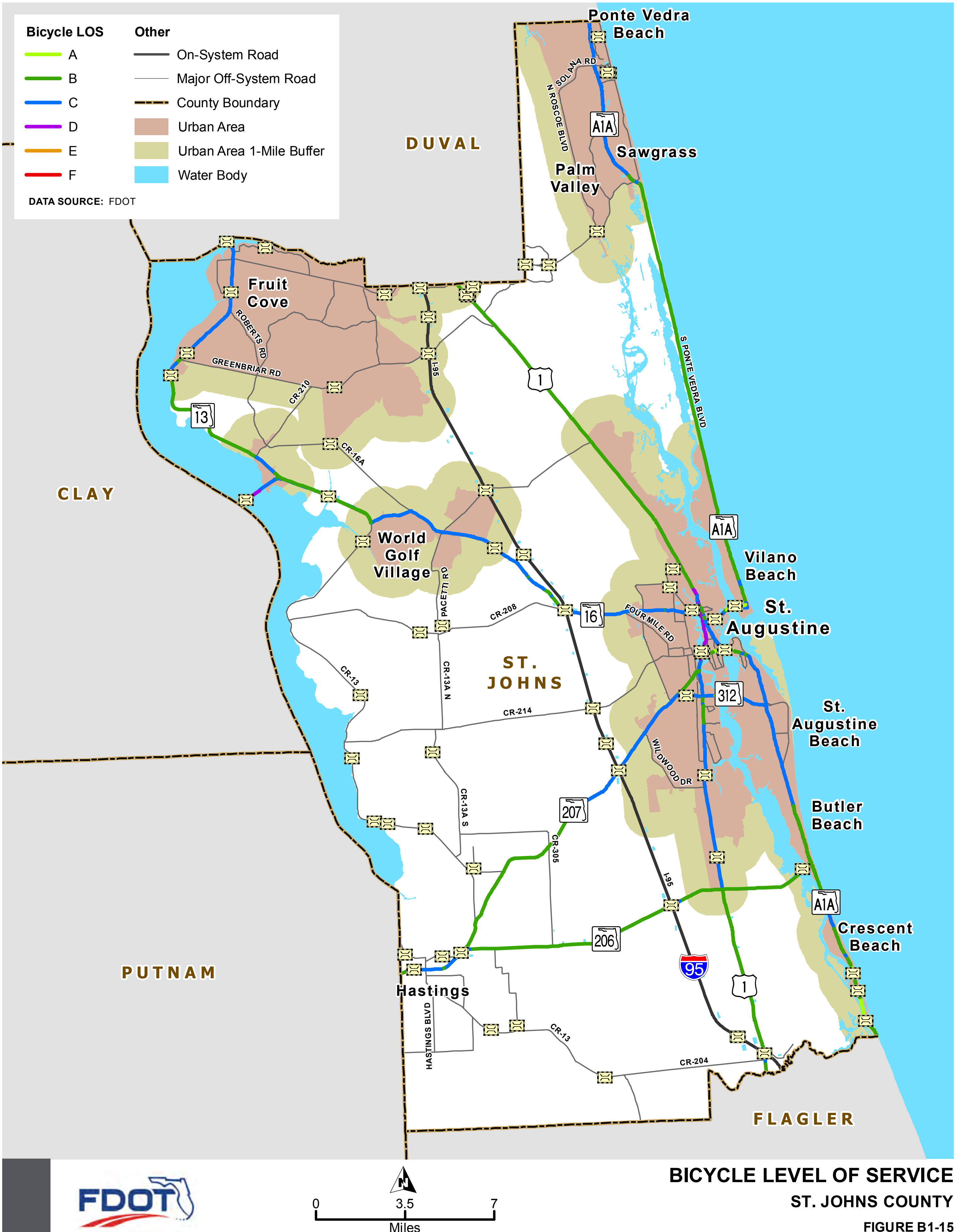



FDOT

# BICYCLE LEVEL OF SERVICE

## PUTNAM COUNTY

FIGURE B1-14

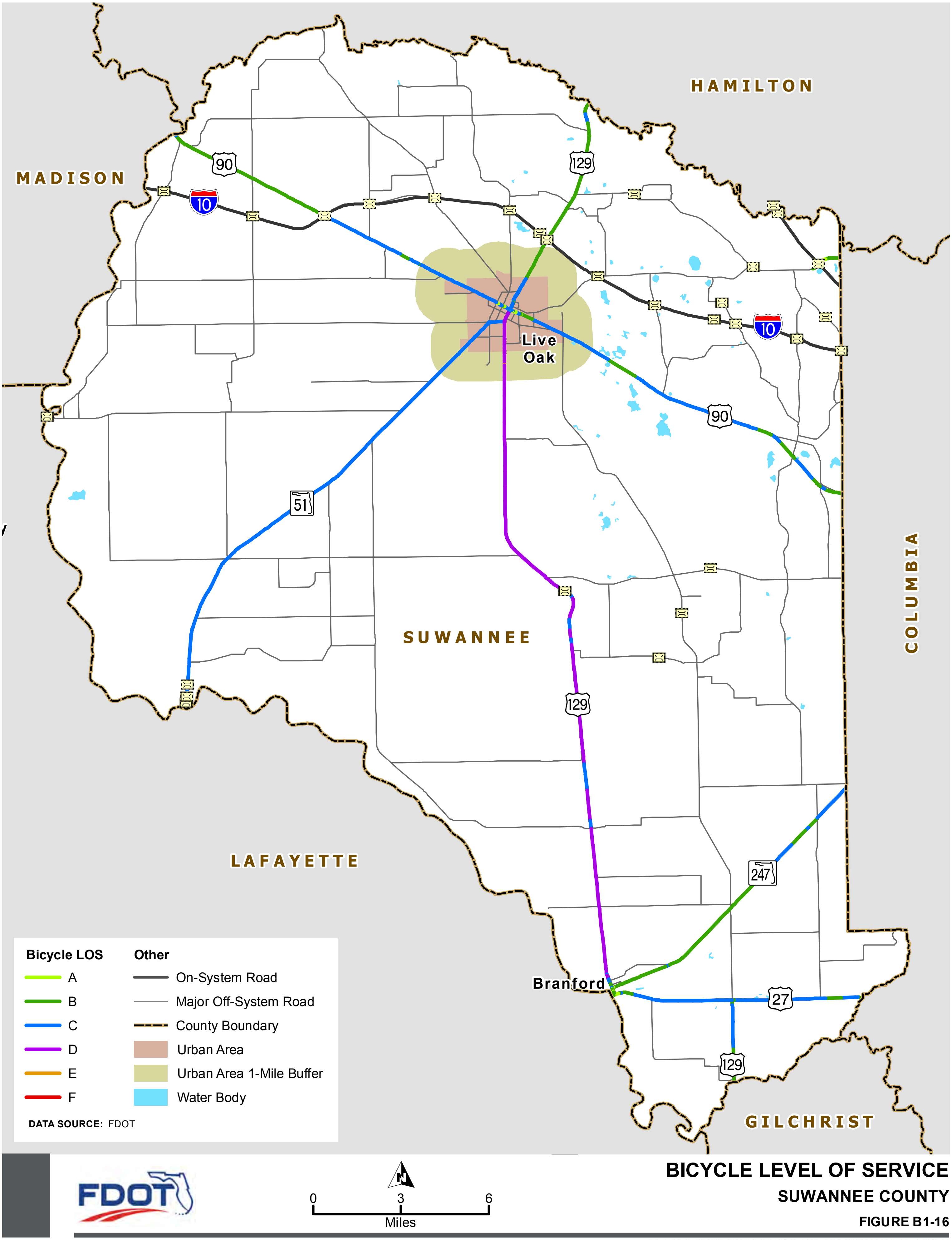



# BICYCLE LEVEL OF SERVICE

## ST. JOHNS COUNTY

**FIGURE B1-15**

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY



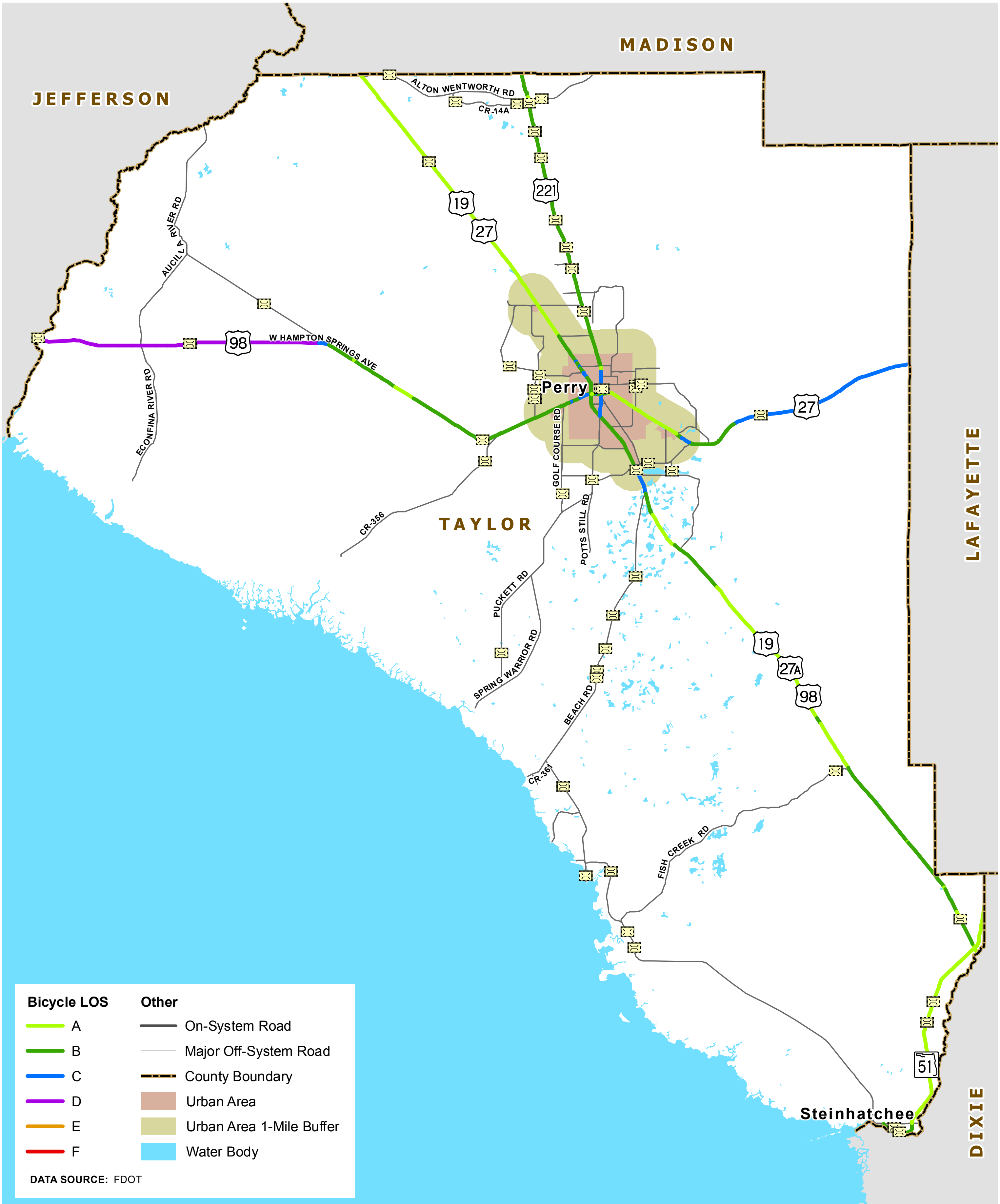

FDOT

# BICYCLE LEVEL OF SERVICE

## SUWANNEE COUNTY

FIGURE B1-16

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY



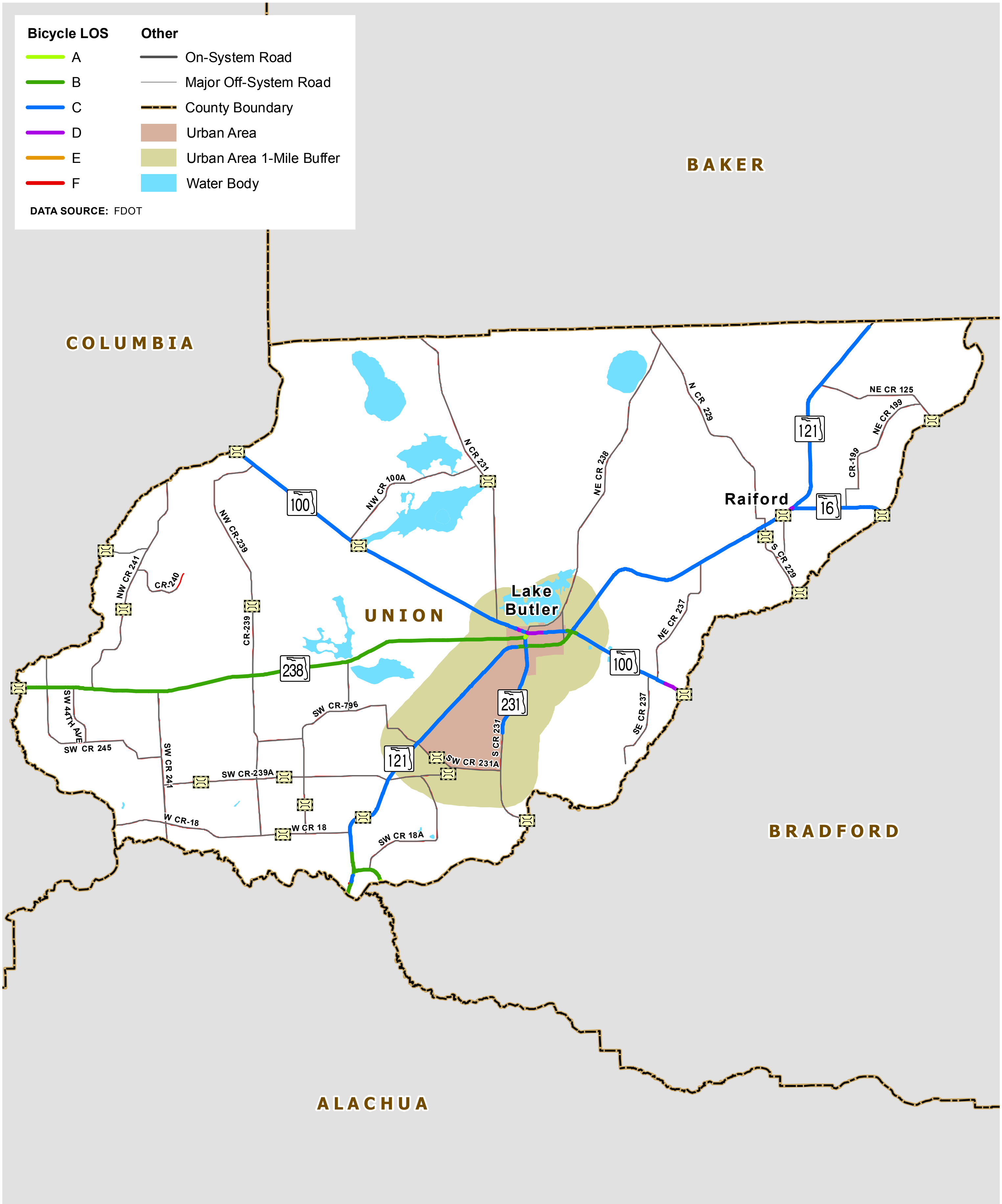

FDOT

0 3.5 7
Miles

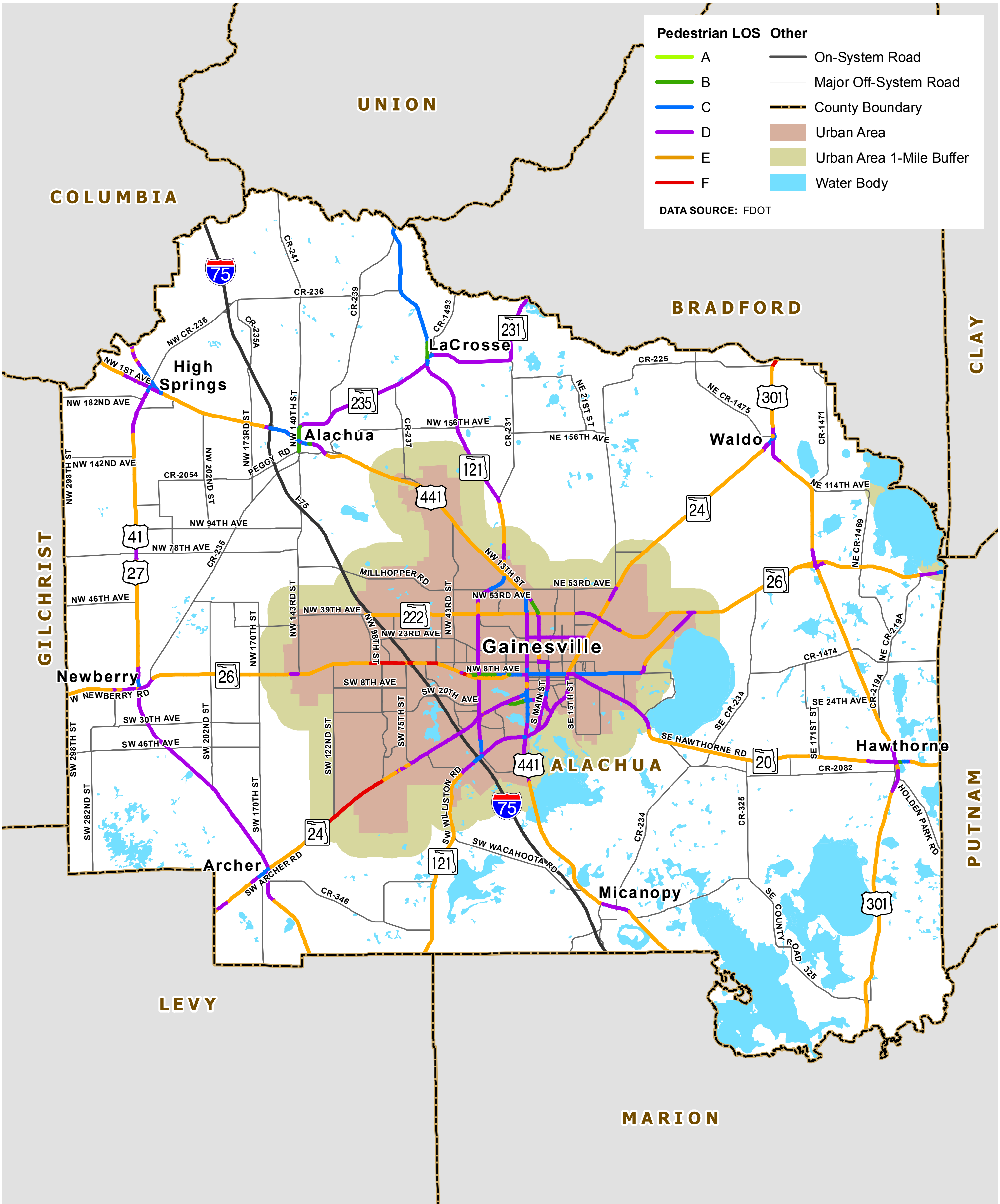
**BICYCLE LEVEL OF SERVICE**

**TAYLOR COUNTY**

**FIGURE B1-17**



Bicycle LOS
A
B
C
D
E
F
Other
On-System Road
Major Off-System Road
County Boundary
Urban Area
Urban Area 1-Mile Buffer
Water Body
DATA SOURCE: FDOT
BAKER
COLUMBIA
UNION
BRADFORD
ALACHUA
Lake Butler
Raiford
100
238
231
121
16
NW CR 100A
N CR 231
NE CR 238
N CR 229
NE CR 125
NE CR 199
CR-199
S CR 229
NE CR 237
SE CR 237
NW CR-239
CR-239
NW CR 241
CR-240
SW 44TH AVE
SW CR 245
SW CR 241
SW CR-239A
SW CR-796
W CR-18
W CR 18
SW CR 18A
S CR 231
SW CR 231A
0
2.5
5
Miles

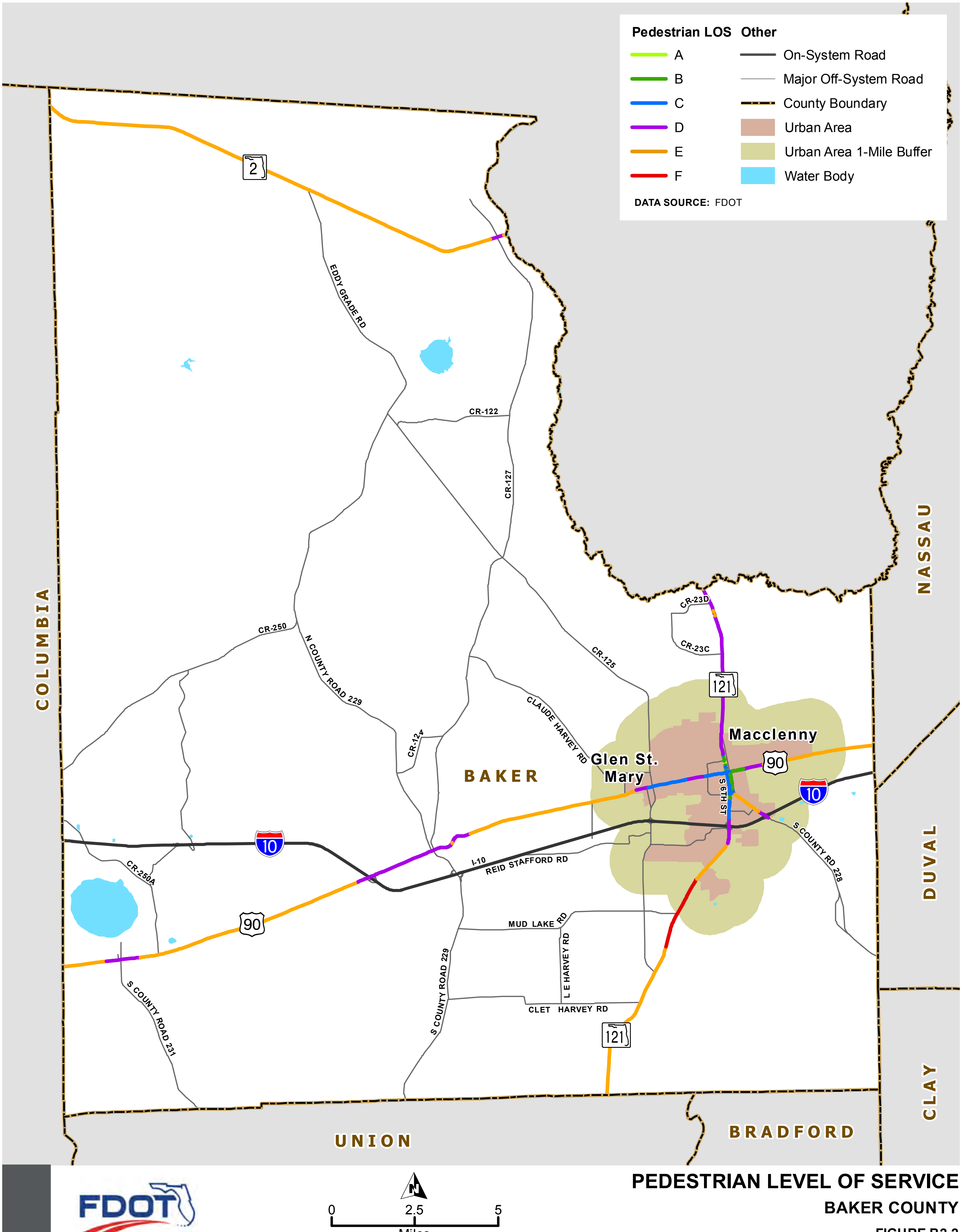



# PEDESTRIAN LEVEL OF SERVICE

## ALACHUA COUNTY

FIGURE B2-1

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

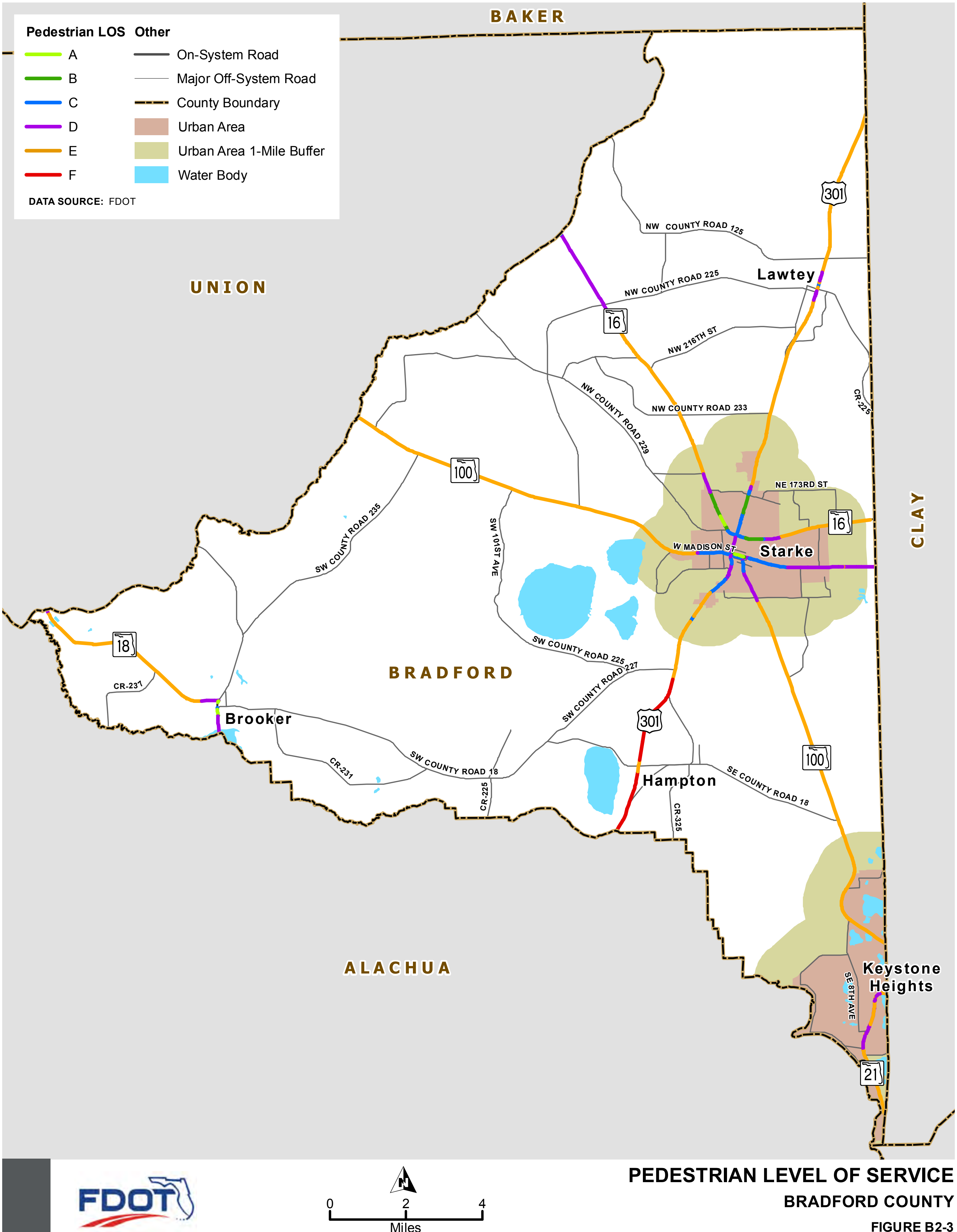



# PEDESTRIAN LEVEL OF SERVICE

## BAKER COUNTY

FIGURE B2-2

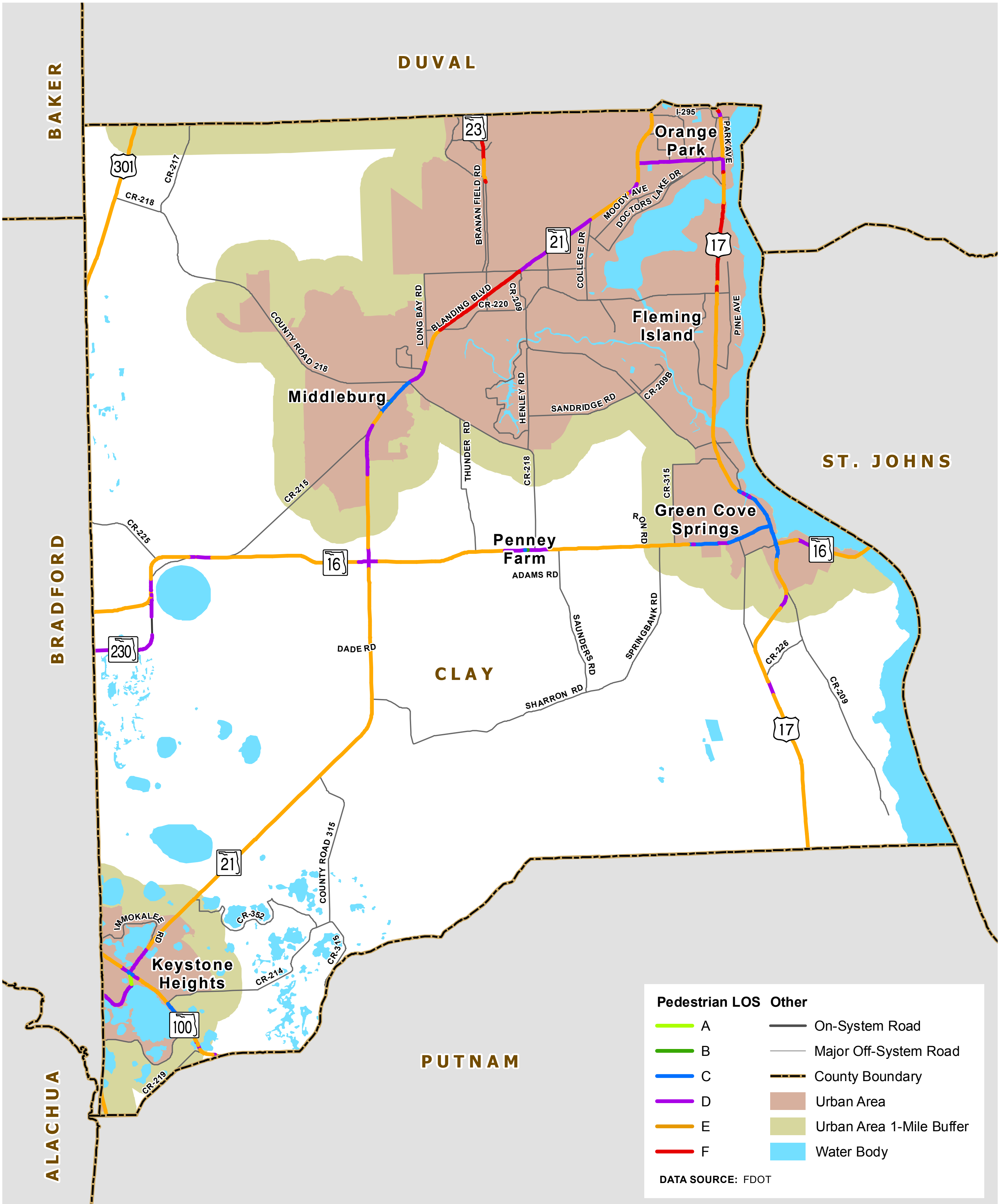
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# PEDESTRIAN LEVEL OF SERVICE

## BRADFORD COUNTY

FIGURE B2-3

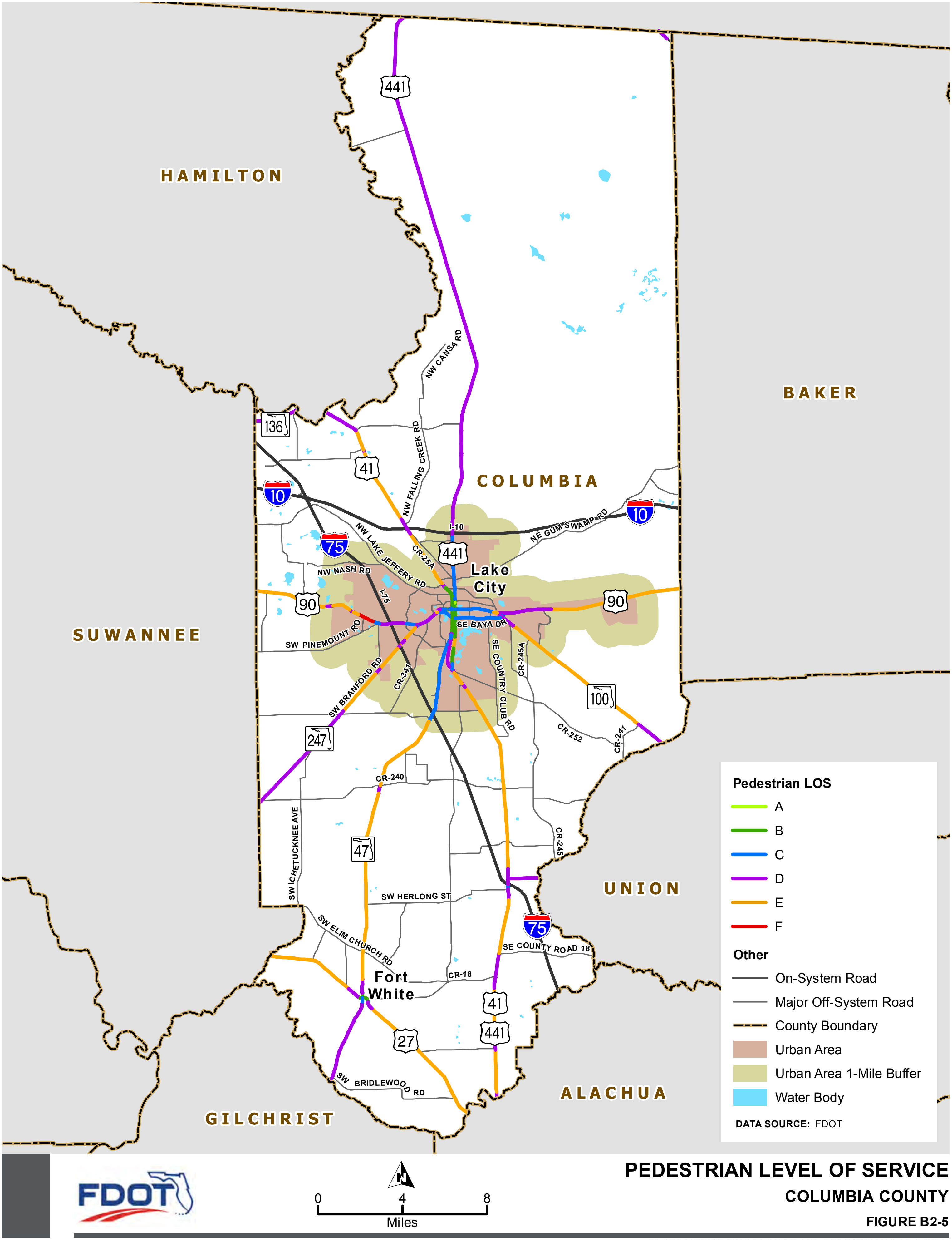



FDOT

# PEDESTRIAN LEVEL OF SERVICE

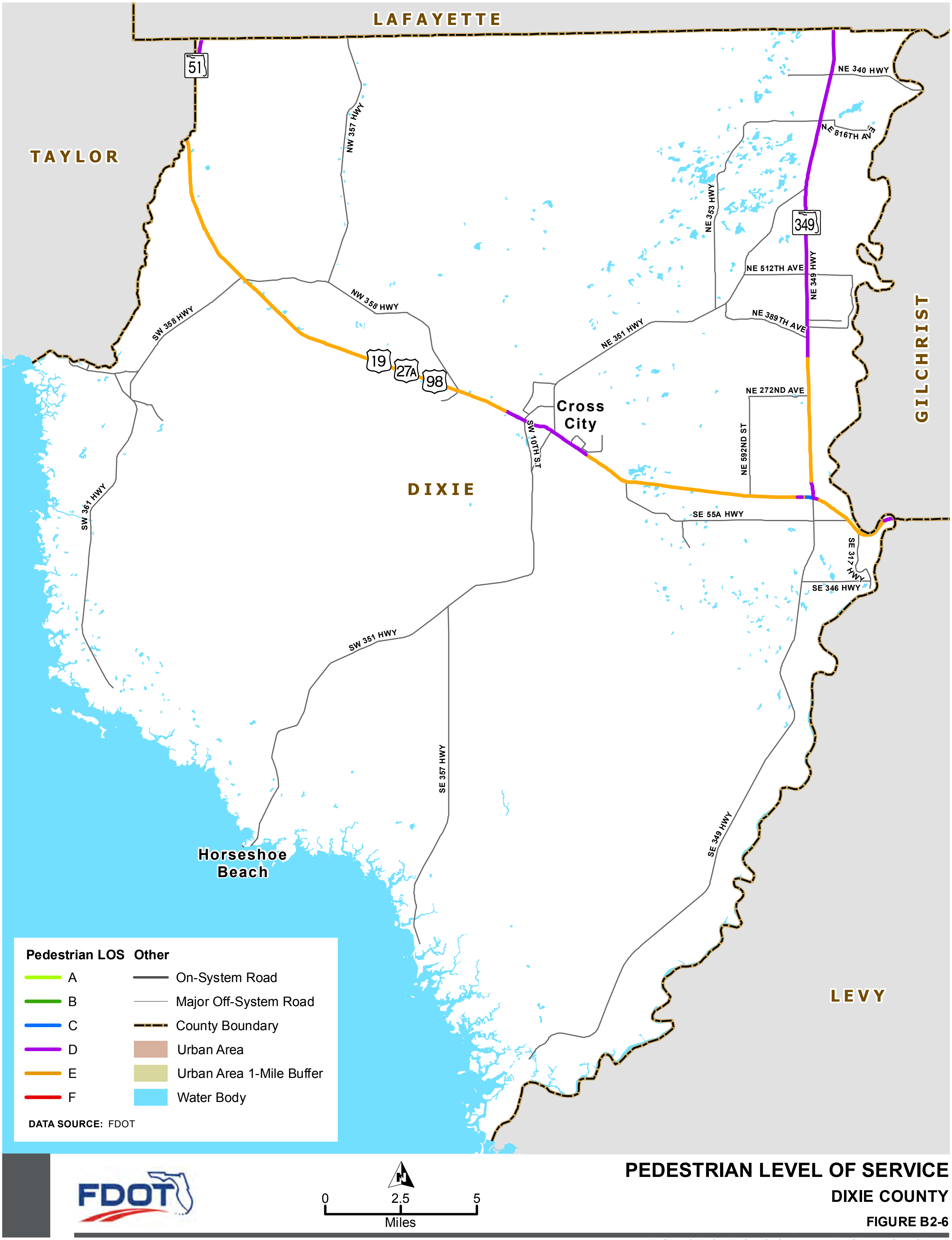
## CLAY COUNTY

FIGURE B2-4




FDOT

# PEDESTRIAN LEVEL OF SERVICE
## COLUMBIA COUNTY
FIGURE B2-5

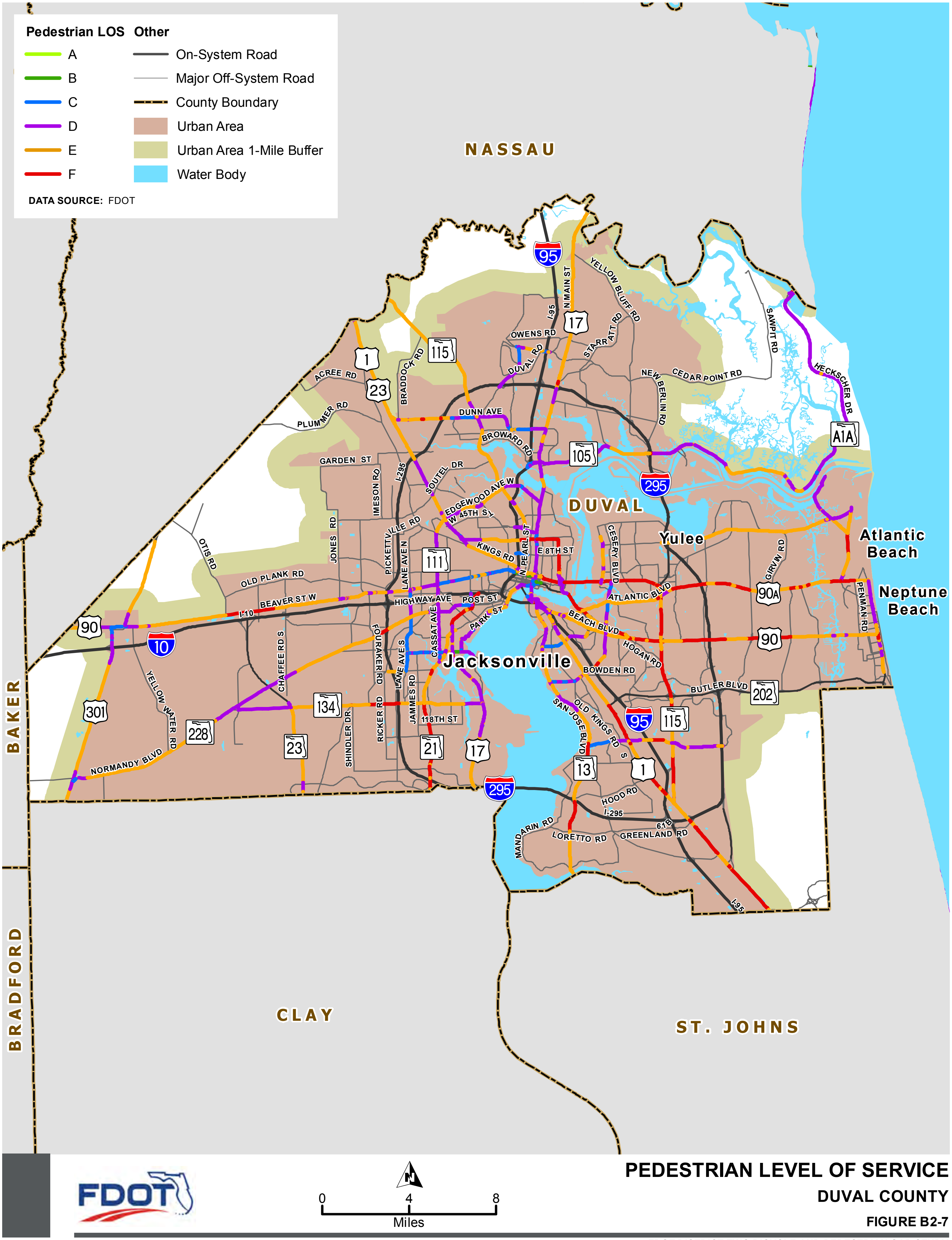



FDOT

# PEDESTRIAN LEVEL OF SERVICE

## DIXIE COUNTY

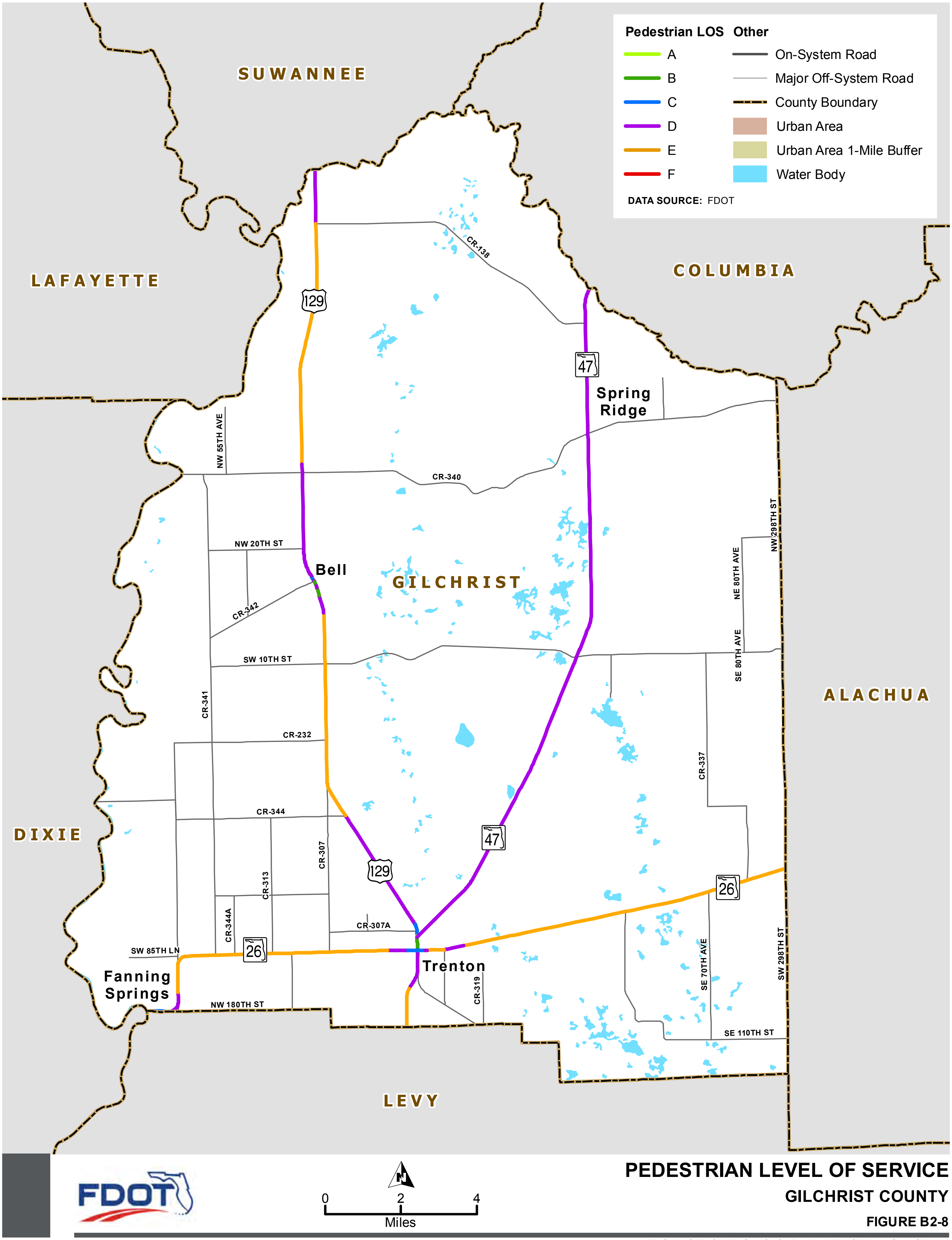
FIGURE B2-6




PEDESTRIAN LEVEL OF SERVICE

DUVAL COUNTY

FIGURE B2-7

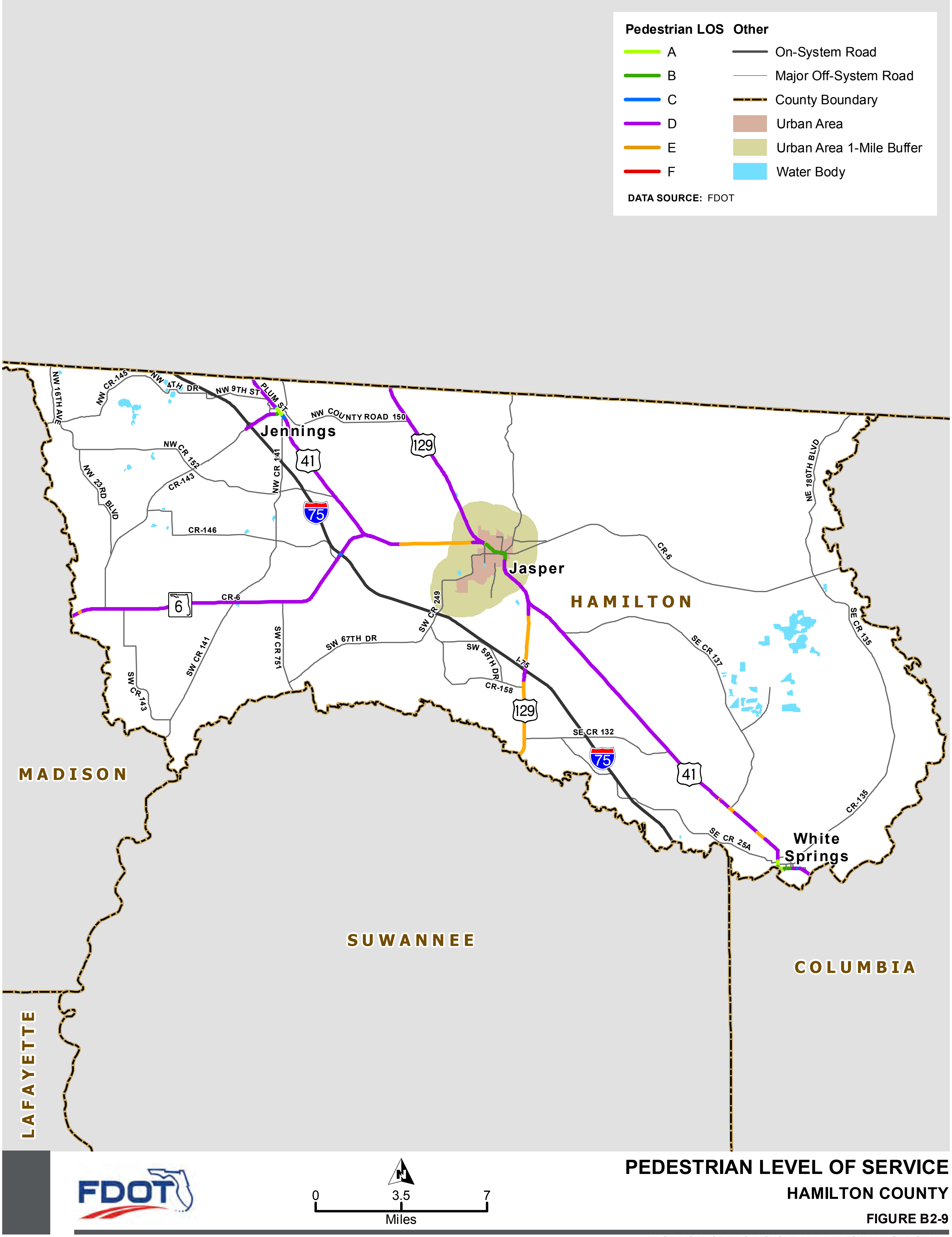



# PEDESTRIAN LEVEL OF SERVICE

## GILCHRIST COUNTY

FIGURE B2-8

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY



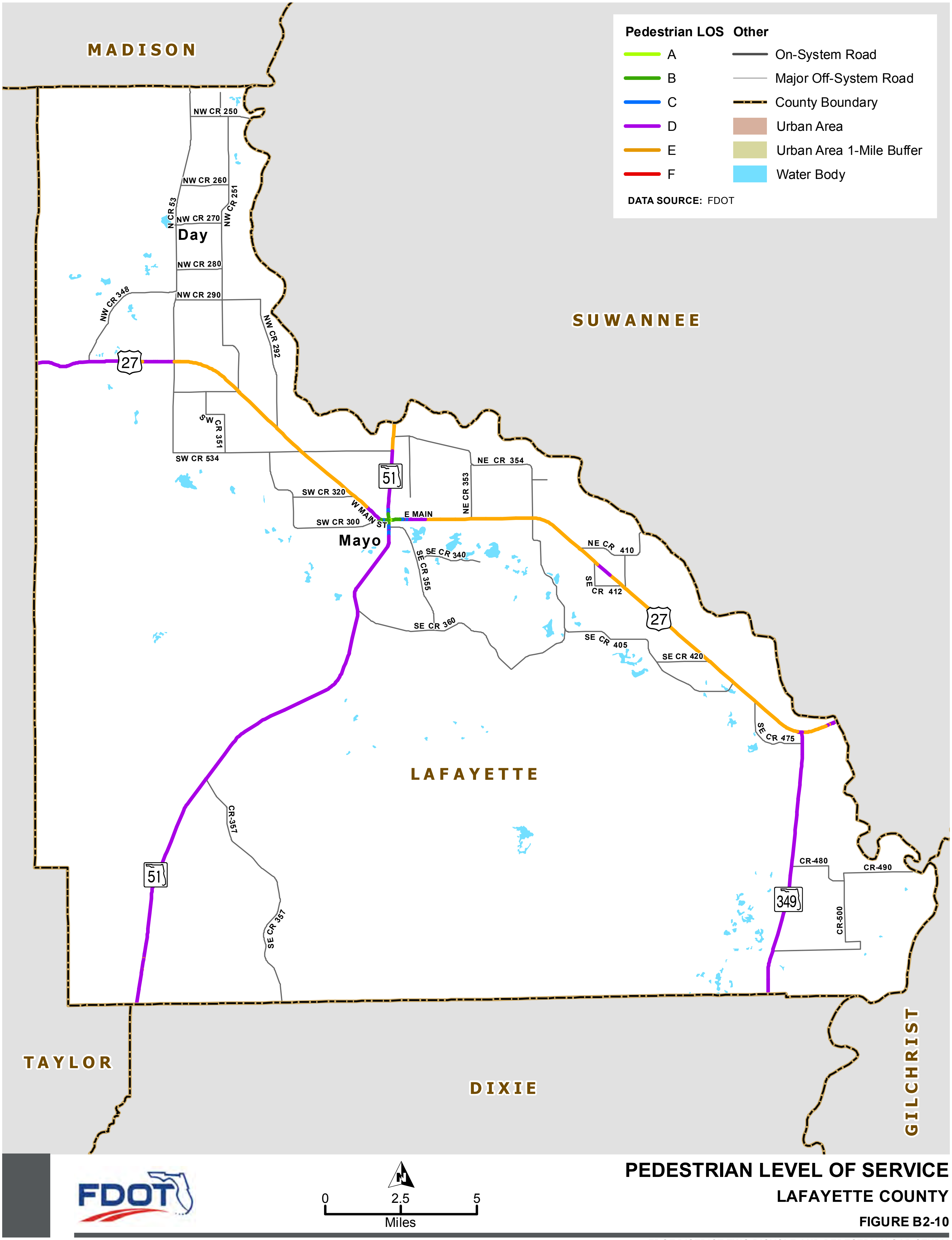

FDOT

# PEDESTRIAN LEVEL OF SERVICE

## HAMILTON COUNTY

FIGURE B2-9

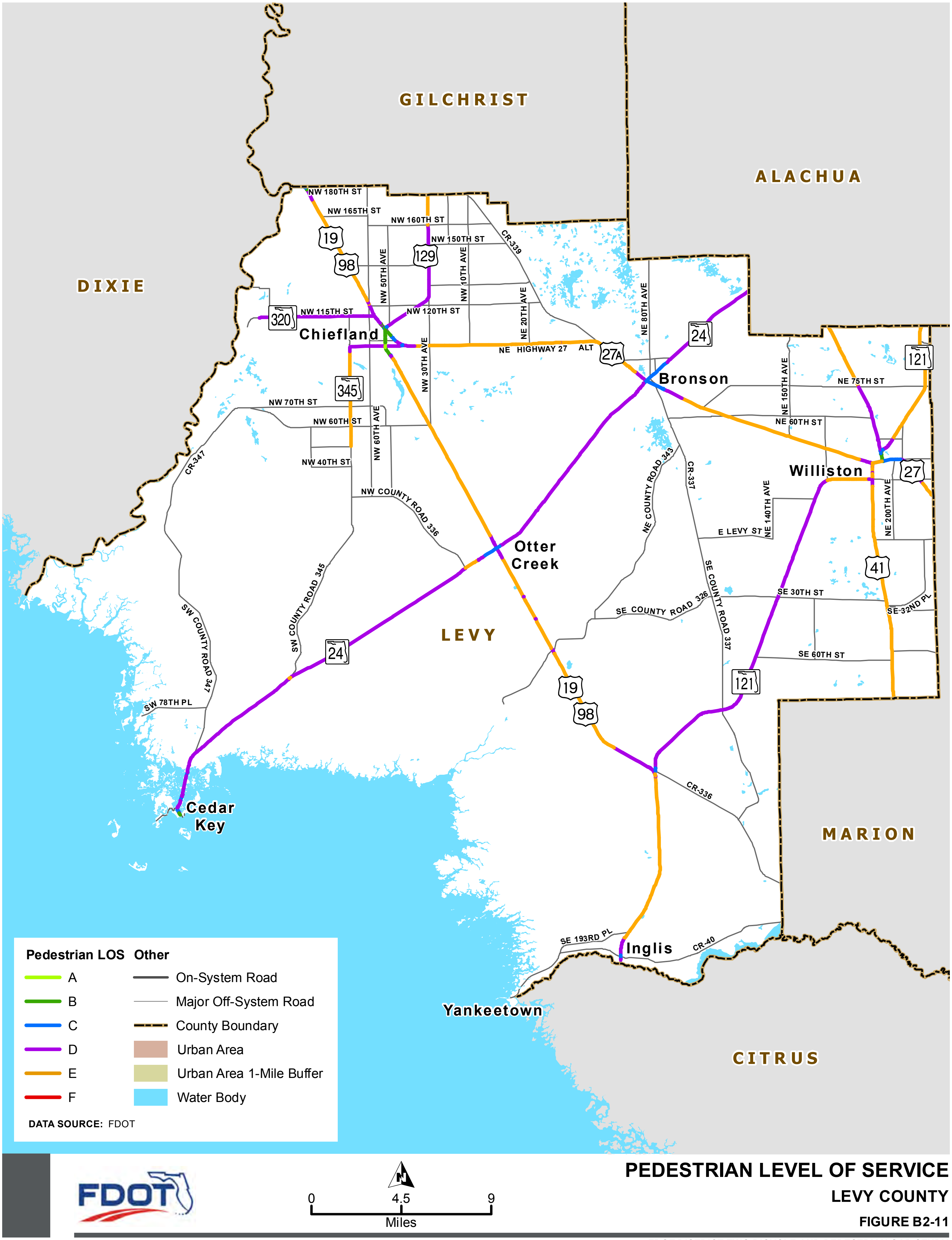
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




**PEDESTRIAN LEVEL OF SERVICE**

**LAFAYETTE COUNTY**

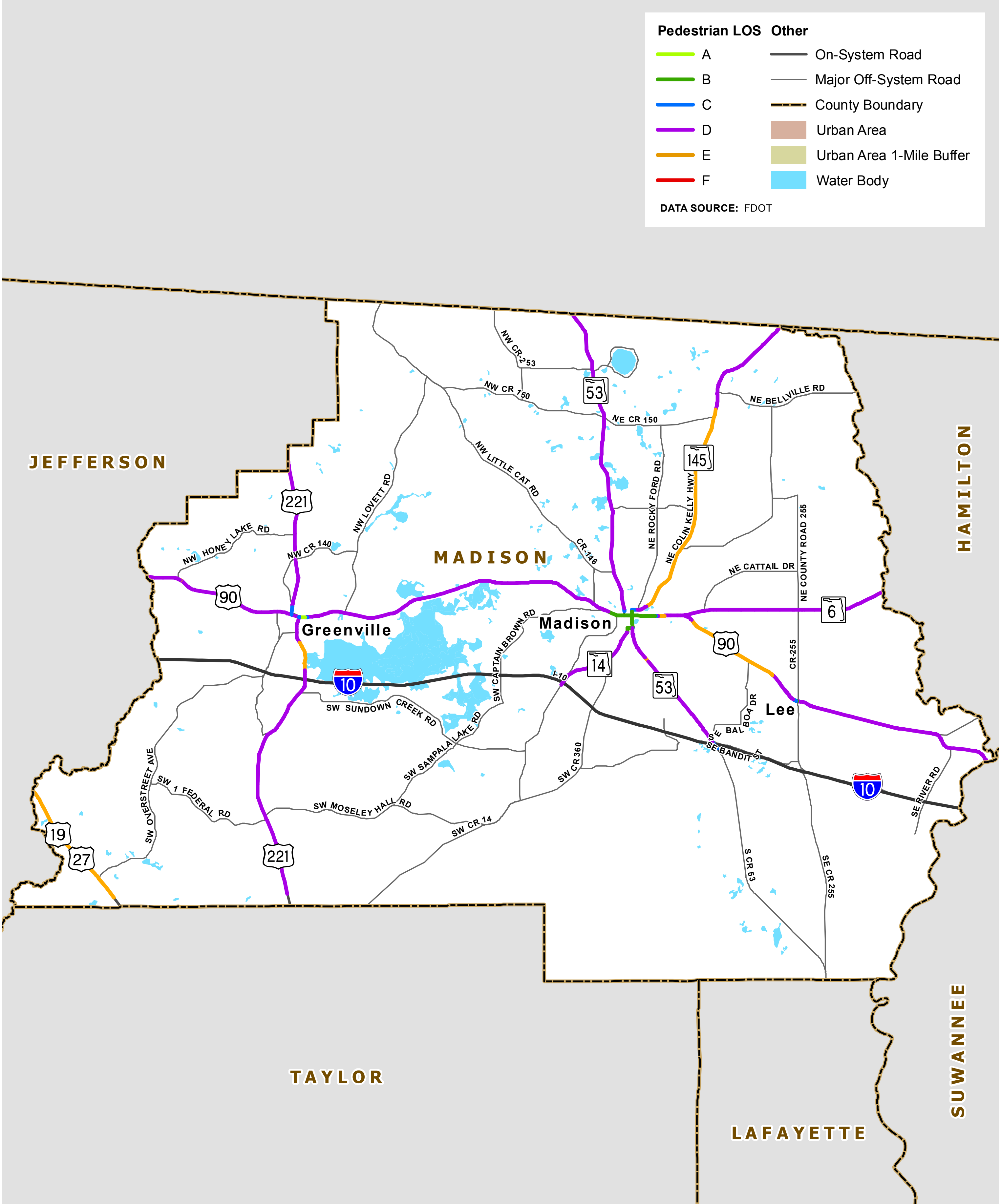
**FIGURE B2-10**




# PEDESTRIAN LEVEL OF SERVICE

## LEVY COUNTY

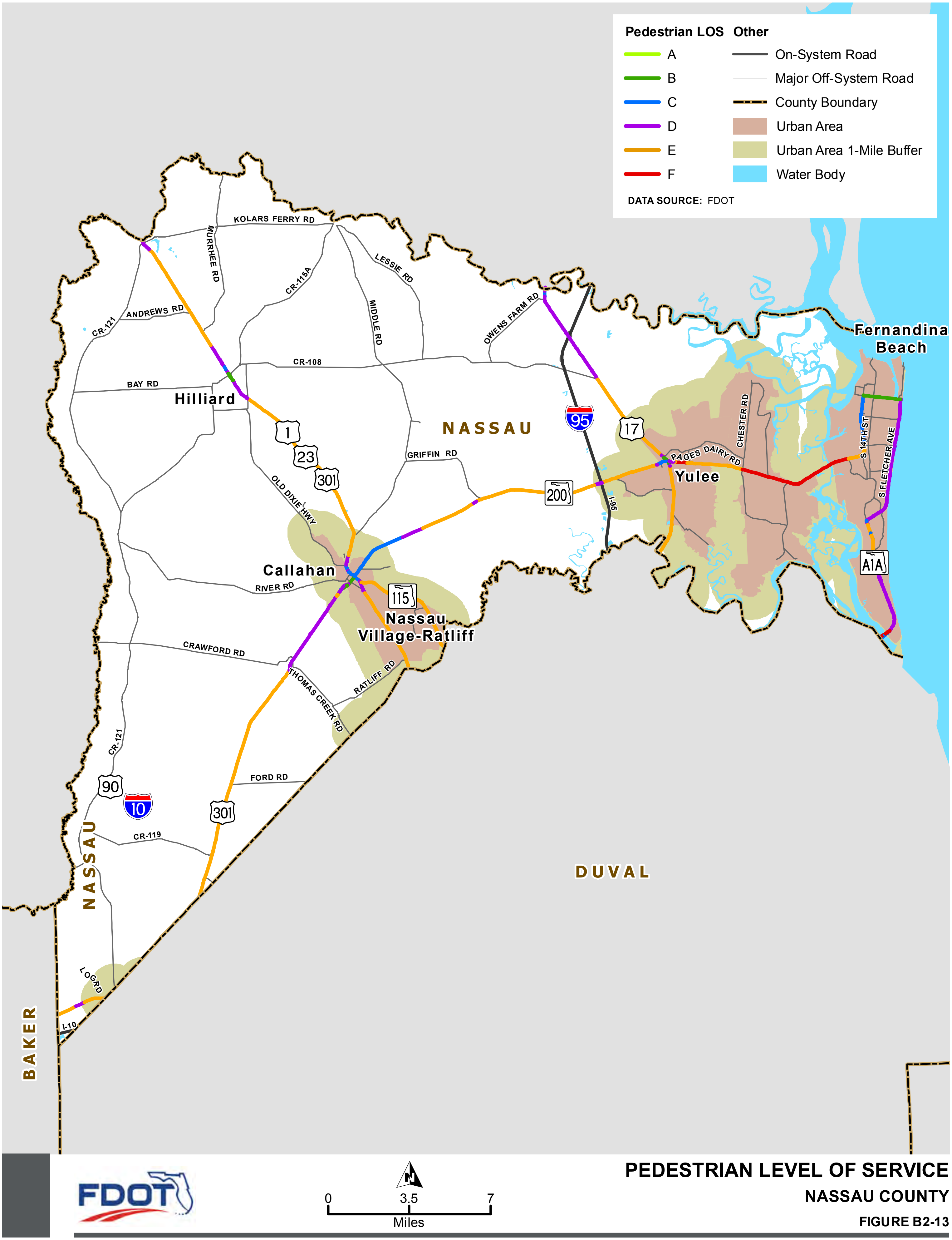
FIGURE B2-11




# PEDESTRIAN LEVEL OF SERVICE

## MADISON COUNTY

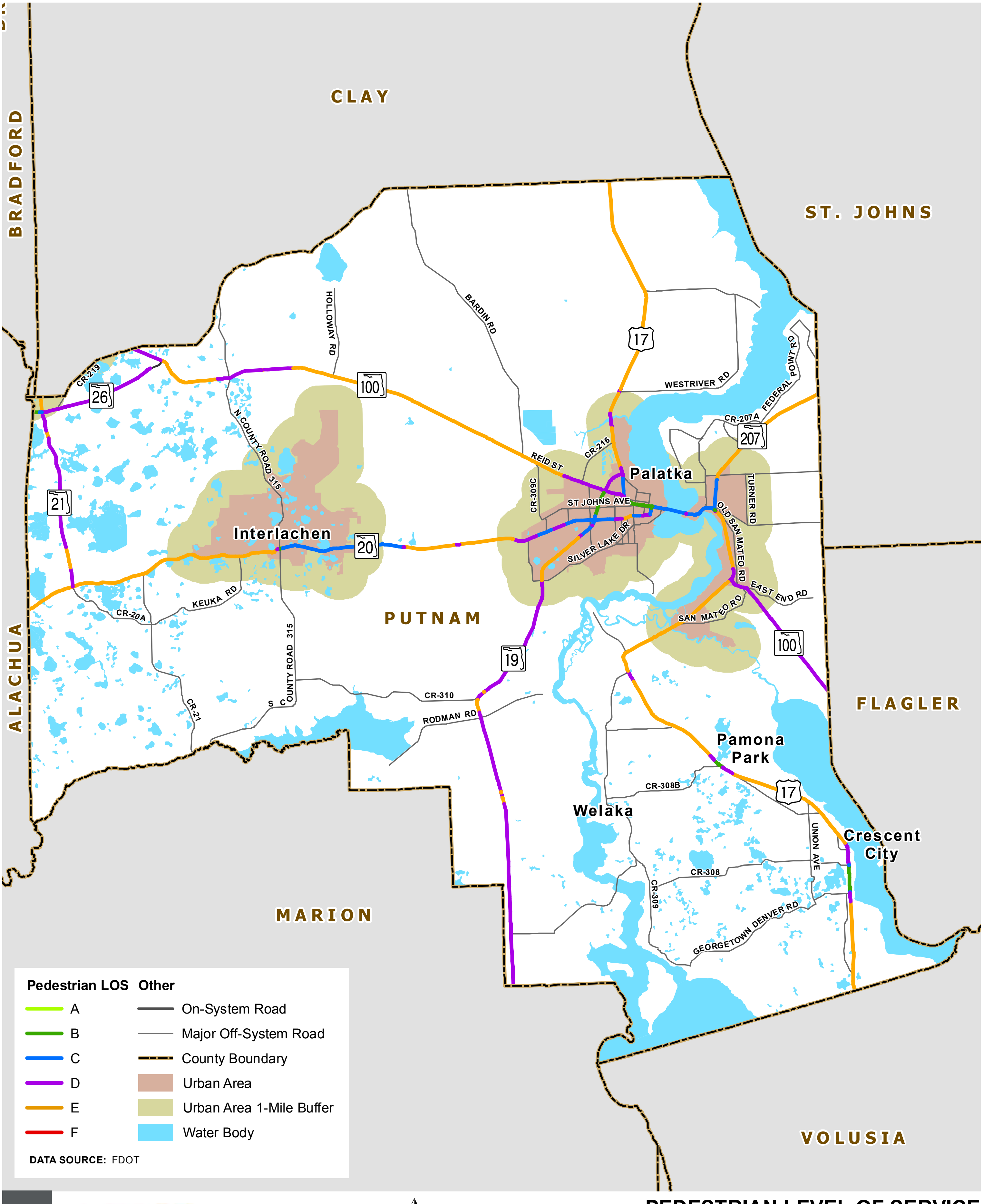
FIGURE B2-12




# PEDESTRIAN LEVEL OF SERVICE

## NASSAU COUNTY

FIGURE B2-13



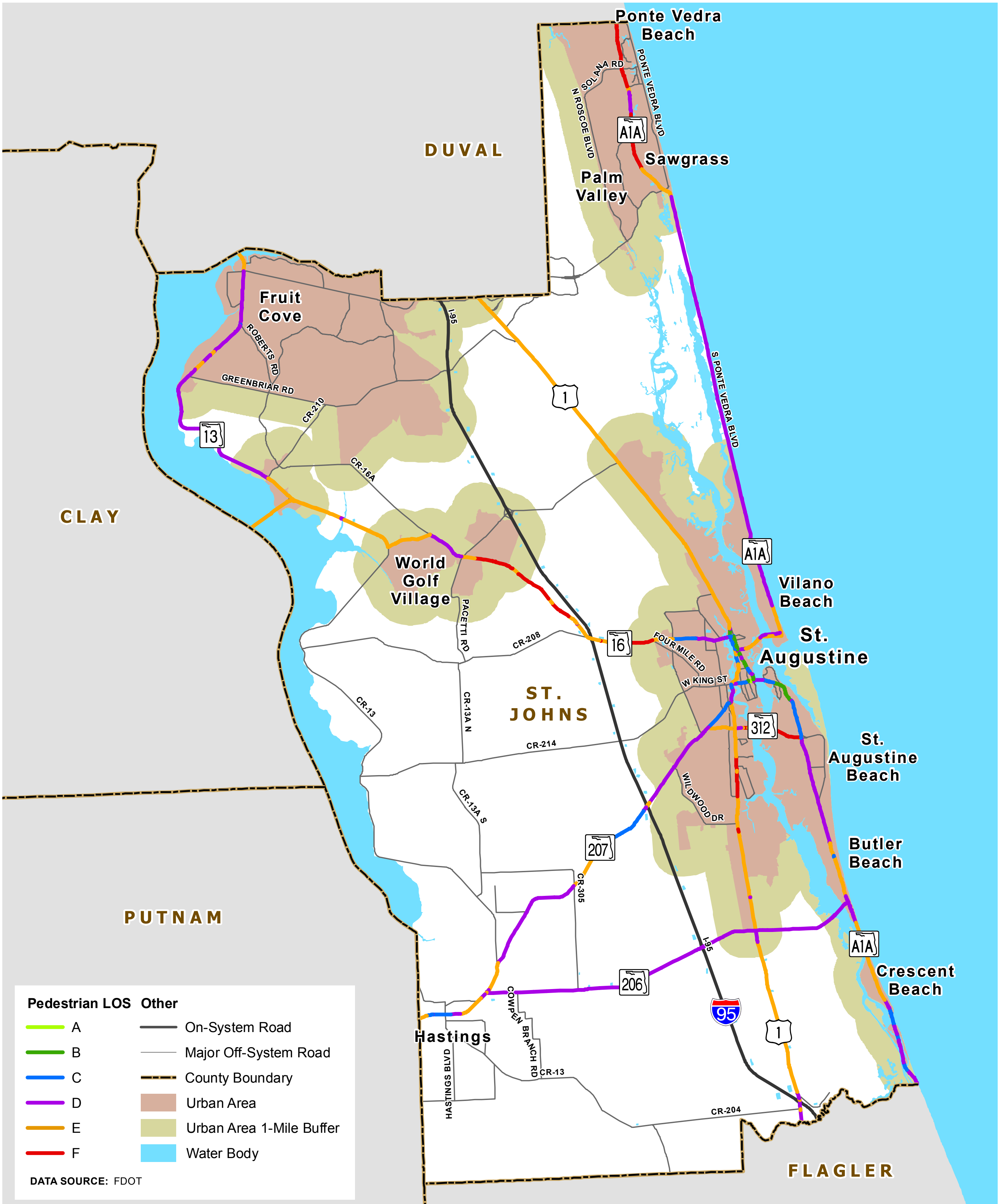

FDOT

# PEDESTRIAN LEVEL OF SERVICE

## PUTNAM COUNTY

FIGURE B2-14

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY



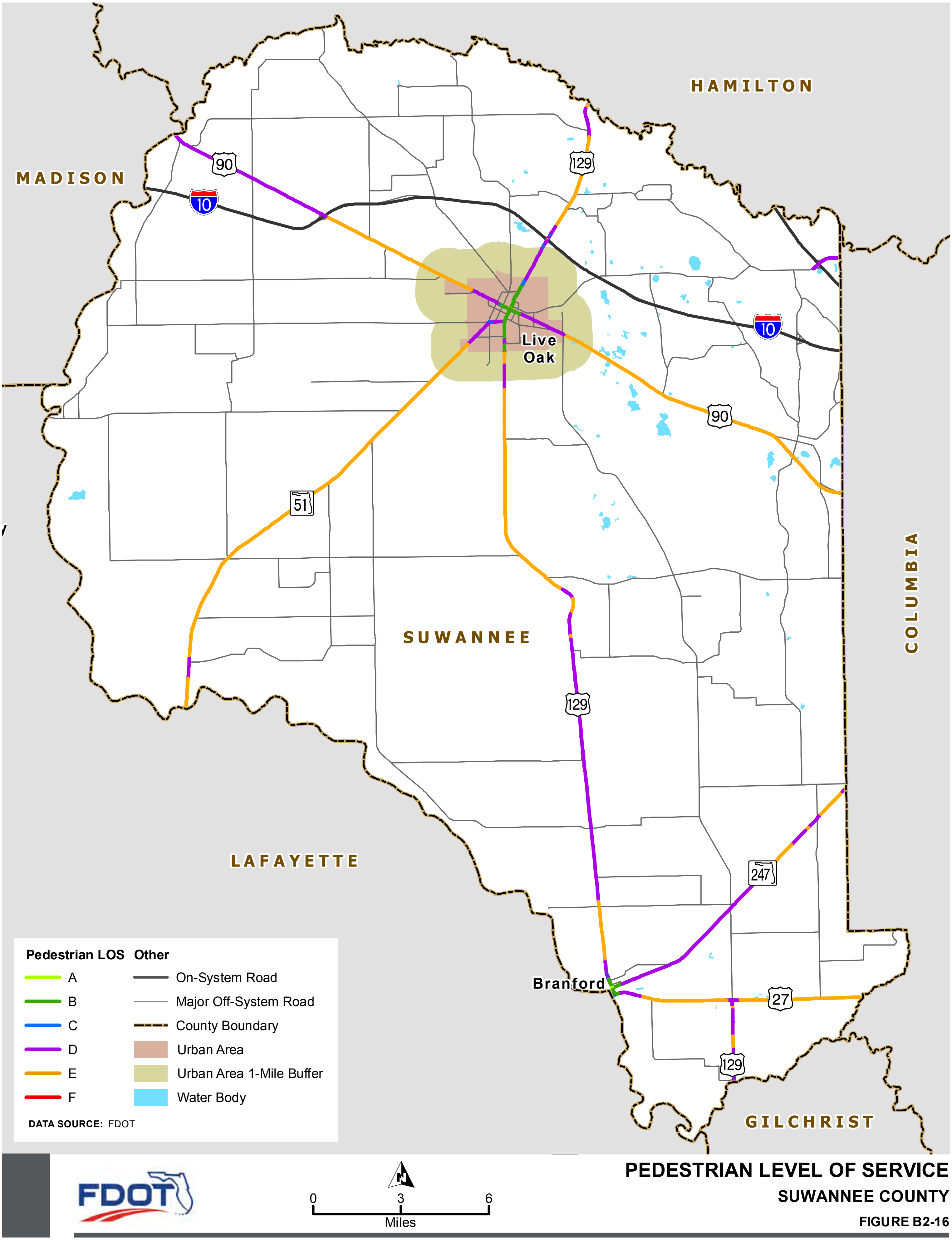

FDOT

# PEDESTRIAN LEVEL OF SERVICE

## ST. JOHNS COUNTY

FIGURE B2-15

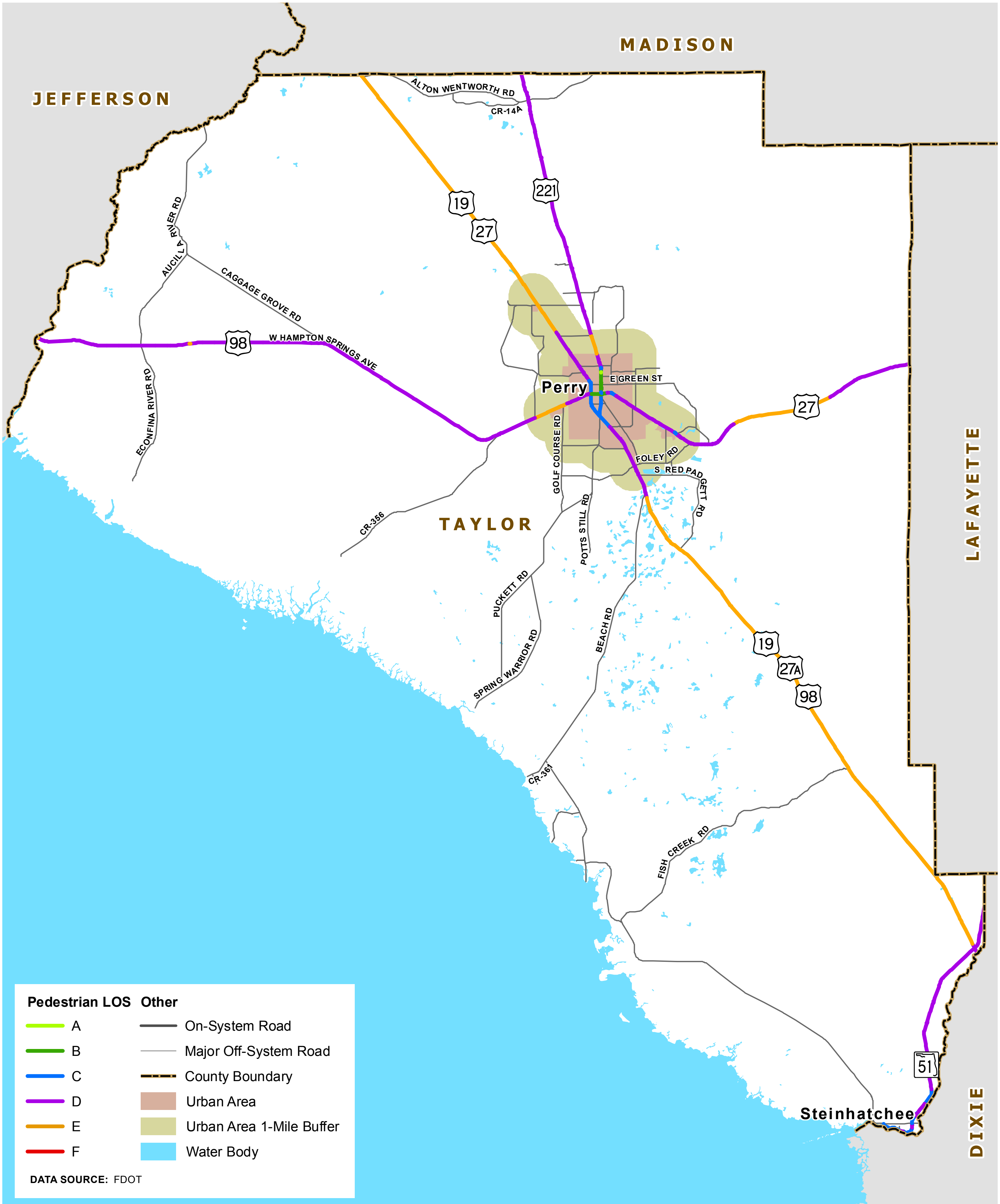
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# PEDESTRIAN LEVEL OF SERVICE

## SUWANNEE COUNTY

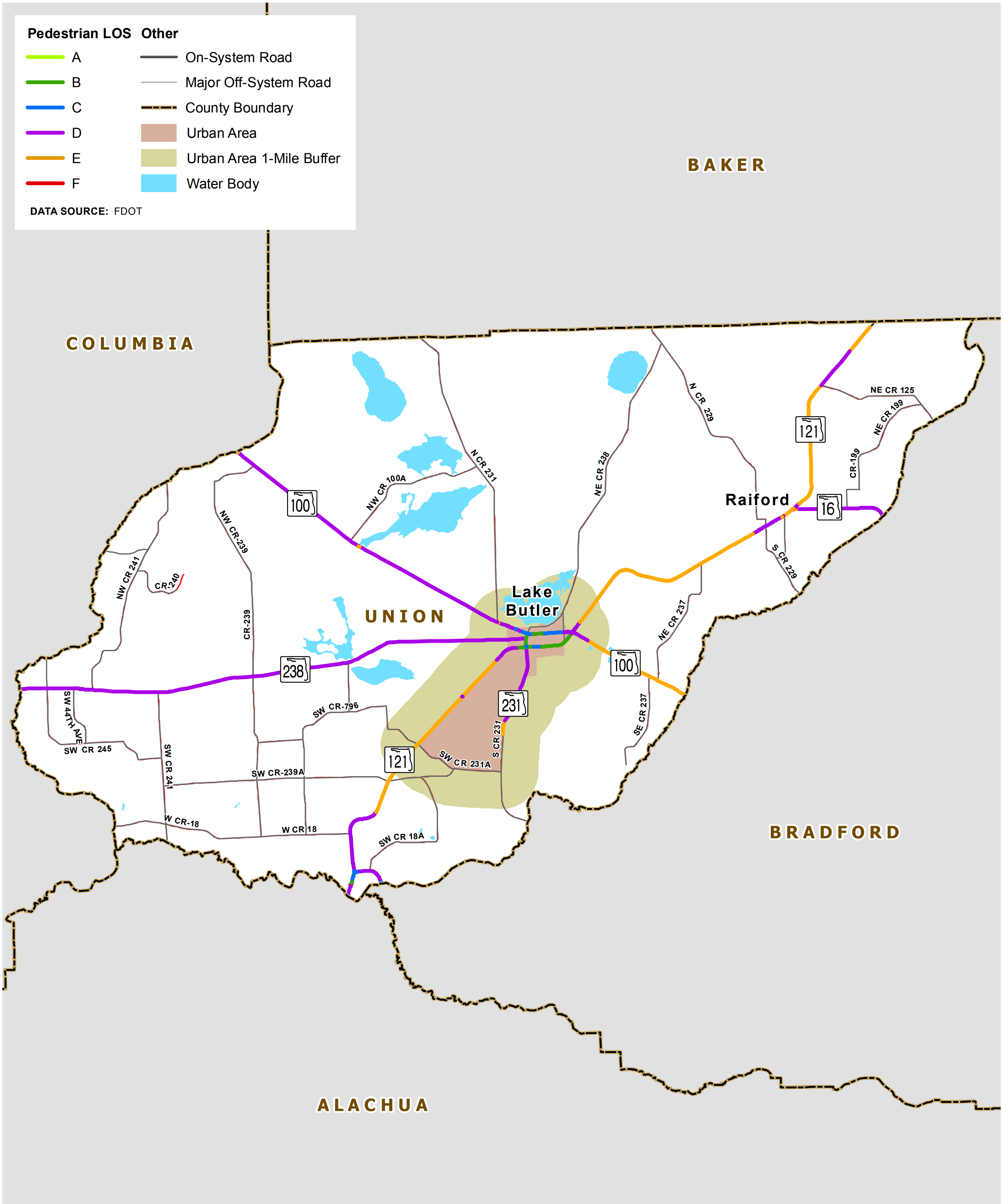
FIGURE B2-16




**PEDESTRIAN LEVEL OF SERVICE**

**TAYLOR COUNTY**

**FIGURE B2-17**




FDOT

# PEDESTRIAN LEVEL OF SERVICE

## UNION COUNTY

FIGURE B2-18


# 05

# Bicycle and Pedestrian Demand

# 5.0 Bicycle and Pedestrian Demand

Travel demand analysis is the process of identifying and quantifying potential bicycle and pedestrian trip activity. The level of service results addressed the "supply" issue of non-motorized transportation options. Another measure is needed to examine the "demand" for bicycle and pedestrian facilities. The travel demand analysis estimates the relative amount of bicycle and pedestrian activity that would occur along a corridor if facilities were constructed and conditions were excellent.

The demand criterion and the level of service criterion are complementary. When coupled, they provide a balanced picture of user need and perceived safety and comfort. For example, a particular corridor segment may have relatively poor walking conditions but relatively high pedestrian activity potential because it is adjacent to an elementary school. Conversely, another segment may have relatively good cycling conditions but relatively low potential bicyclist activity because it is in an isolated location.

## 5.1 Methodology

To perform a travel demand analysis for the bicycle and pedestrian modes, a methodology is employed that recognizes the unique impediments to that mode. Some impediments that hinder bicycle and pedestrian travel include poor accommodation of bicyclists and pedestrians within the existing transportation network. Existing bicycle and pedestrian counts do not indicate the potential bicycle trip activity within a roadway network as the facilities may not support an acceptable level of safety and comfort to a potential user. Therefore, alternative or surrogate measures of assessing bicycle and pedestrian trip activity are needed.

The demand analysis is based on a variation of the Latent Demand Score (LDS) method. The LDS method estimates the latent or potential demand for bicycle travel (i.e., the level of travel that would occur if a bicycle facility existed on a road segment) by analyzing the proximity and trip generation potential of activity centers to determine the potential demand for the facility (as explained in FHWA-RD-98-166).

The potential for trip activity was evaluated based on the characteristics within the surrounding area at the traffic analysis zone (TAZ) level of each segment for three trip attraction/generation variables:

- Population
- Employment
- School enrollment

The TAZs and socioeconomic data for the trip attraction/generation variables were derived from the updated Florida Statewide Model version 5.124. The 2010 socioeconomic data represent the current demand. The 2040 socioeconomic data represent future demand. The same series of steps were taken to develop current and future demand. The specific steps, carried out using GIS software for each network segment, are listed below:

Create a buffer around the segment to represent the bicycle and pedestrian travel shed (the propensity of non-motorized trips typically begins to decline dramatically as distances increase);[4]

Intersect the segment travel shed buffer with the current year (2010) or future year (2040) TAZs;

Calculate the proportion of the travel shed buffer that intersects the various TAZs;

Multiply the intersect area proportions for each TAZ by the projected population, employment, and school enrollment for those TAZs (this effectively calculates the TAZ data for the portion of the TAZ that coincides with the travel shed); and

Sum the data for each of the TAZs that intersects any portion of the travel shed buffer to estimate the total population, employment, and school enrollment for the segment.

Those segments with the highest level of projected population, employment, and school enrollment within close proximity are those with the highest latent demand for bicycle and pedestrian activity.

## 5.2 2010 Estimated Demand

**Figures C1-1** through **C1-18** show the bicycle and pedestrian 2010 estimated demand for each county. The demand determination values ranged from 0 (lowest demand) to 100 (highest demand). Not surprisingly, the greatest demand occurs in Alachua and Duval Counties, the District’s most populous counties.

Alachua County’s highest demand segments are in Gainesville near the University of Florida on University Avenue (S.R. 26) from U.S. 441/SW 13th Street (S.R. 25) to Main Street and on U.S. 441/SW 13th Street (S.R. 24) from University Avenue (S.R. 26) to Archer Road (S.R. 24). **Figure C1-1** provides details for 2010 demand in Alachua County.

Downtown Jacksonville had the highest determination values in the District (see **Figure C1-7**). estimated demand was high on Union Street (S.R. 139), State Street (S.R. 139), Forsyth Street (S.R. 228), Adam Street (S.R. 228), Main Street (S.R. 5), Ocean Street (S.R. 5), Prudential Drive (S.R. 5), Arlington Expressway (S.R. 10A), Acosta Bridge Expressway (S.R. 13), Hart Bridge Expressway (S.R. 228), I-95, JTB Boulevard (S.R. 202), and Roosevelt Boulevard (S.R. 15).

Unlike the level of service evaluation, for which limited access facilities were excluded, such facilities were evaluated as part of the latent demand analyses. This was done considering the possibility that shared use path facilities designed for bicycle and pedestrian travel could be constructed within the rights-of-way of such roadways. Currently, Florida Statutes 316.091 prohibits bicycle or other human-powered vehicle on limited-access and interstate facilities; however, according to Florida Statutes 349.04, Jacksonville Transportation Authority’s Jacksonville Expressway System is an exception to this law.

Outside of the most populous counties, Clay and St. Johns Counties had segments of high estimated potential demand. For instance, Kingsley Avenue (S.R. 224) in Clay County, and King Street and Cathedral

[4] For this variation of the Latent Demand Score method, a buffer of 0.75-mile was chosen, which is consistent with recent applications by many Florida metropolitan planning agencies. Complete application of the Latent Demand Score method uses buffers ranging from 0.25-mile to 3 miles based on trip elasticity curves for various trip purposes (commute, school, recreational, etc.) for the two travel modes.

Place (S.R. 5A) in St. Johns County, show relatively high determination values. The remaining counties in the District had relatively low determination values.

## 5.3 2040 potential Demand

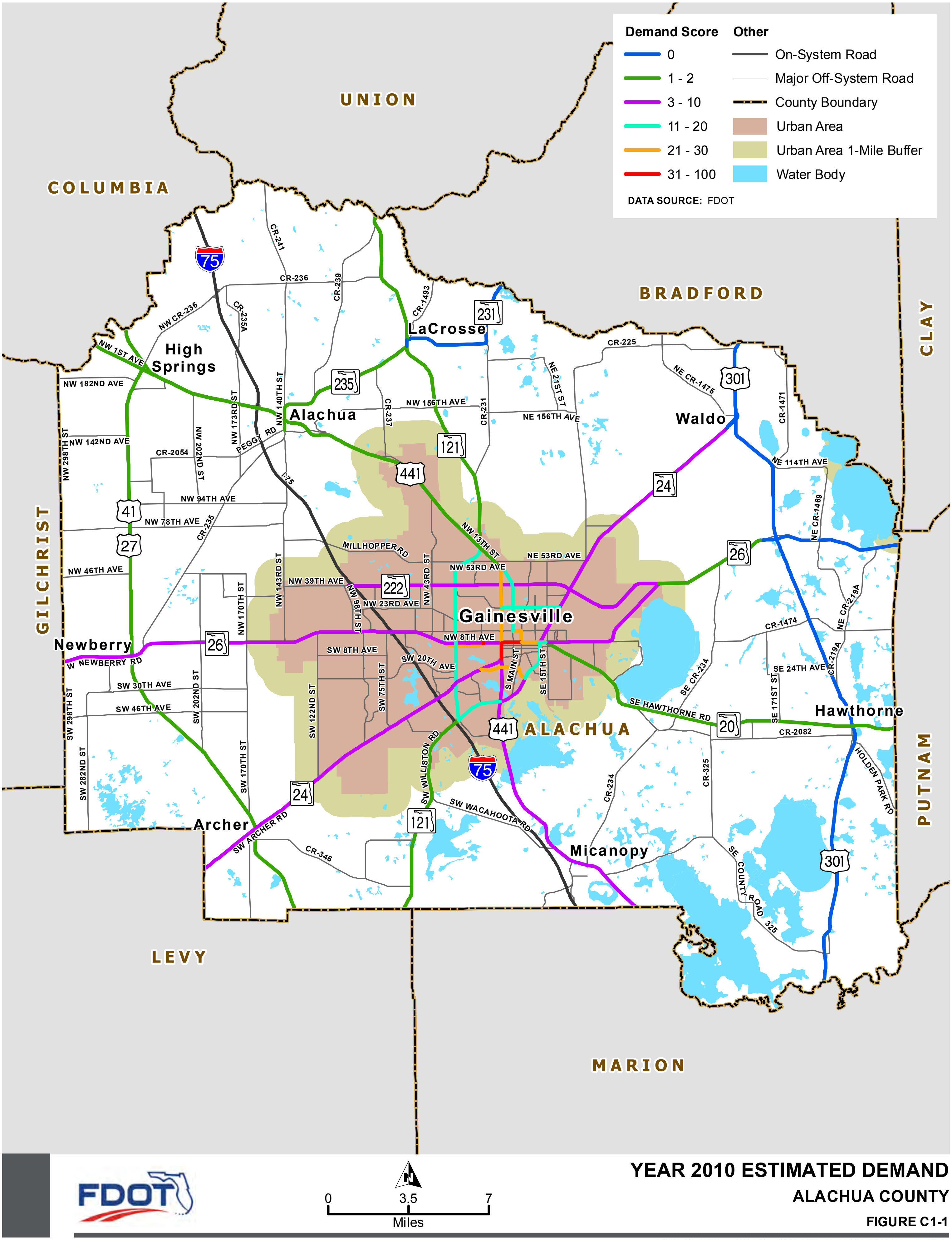
**Figures C2-1** through **C2-18** show the bicycle and pedestrian 2040 potential demand for each county. The process outlined in the previous section yielded demand scores for each analysis section. The scores were scaled so that the highest latent demand score had a value of 100, while the lowest latent demand score had a value of 0. All other scores were scaled proportionately between the maximum and minimum values. Because of the expected growth in population, employment, and school enrollment in 2040 compared to 2010, there is higher demand on many roadways.

In Alachua County, Williston Road (S.R. 331) from U.S. 441 (S.R. 25) to SW 34th Street (S.R. 121) and from S.R. 226 to University Avenue (S.R. 26), has high demand when compared to 2010. See **Figure C2-1** for details.

Duval County added Beaver Street/U.S. 90 (S.R. 10) from Ocean Street (S.R. 5) to the Nassau County Line and Southside Connector (S.R. 113) to I-295 to its list of segments with higher demand. See **Figure C2-7** for details.

St. Johns County also had higher demand on Castillo Drive/San Marco Avenue (S.R. 5A) from King Street to S.R. 16, May Street (S.R. A1A) from San Marco Avenue to Vilano Road (S.R. A1A), and S.R. 312 from S.R. 207 to U.S. 1 (S.R. 5). See **Figure C2-15**.

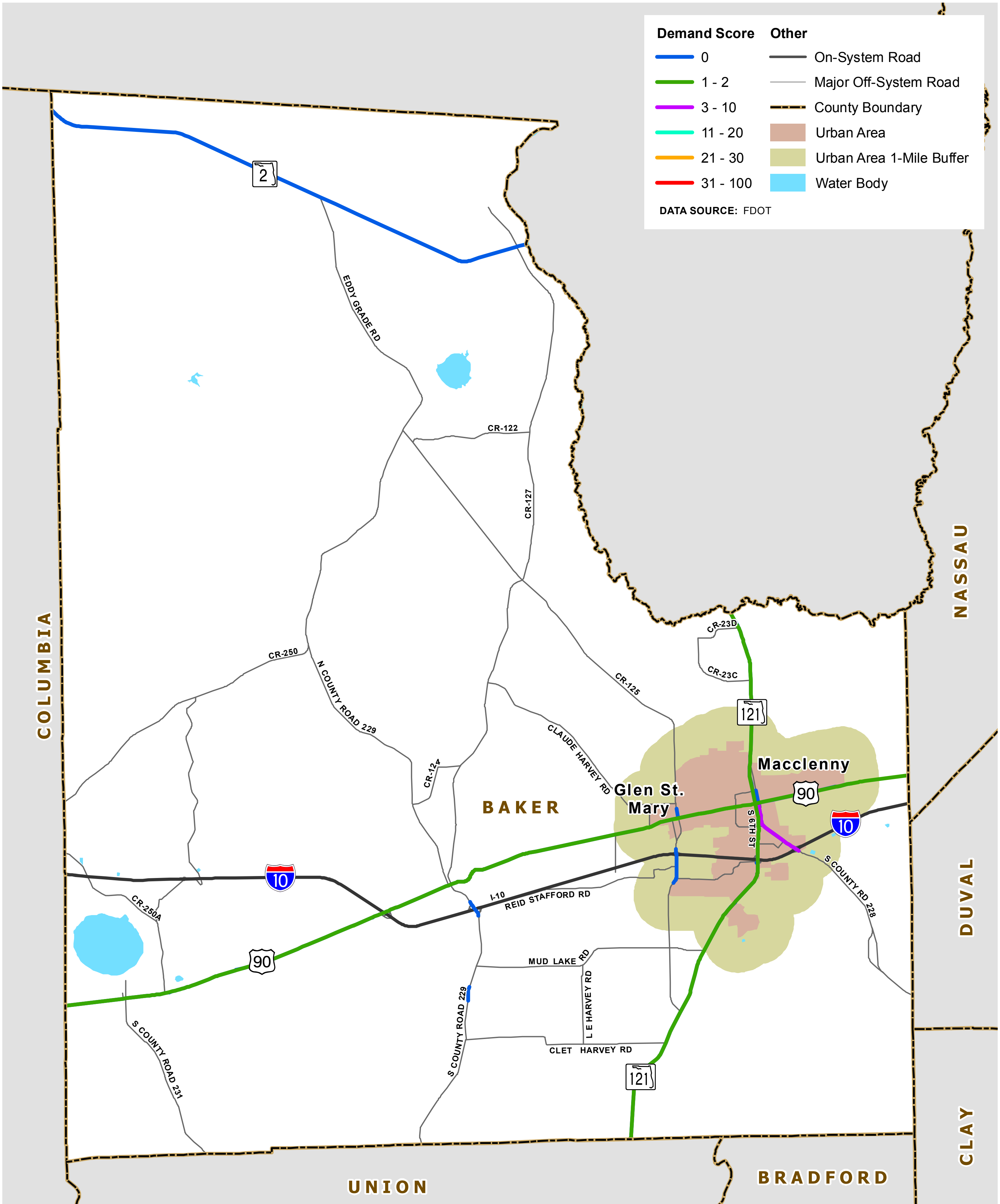
The remaining counties in District Two produced relatively low determination values in 2040.




YEAR 2010 ESTIMATED DEMAND

ALACHUA COUNTY

FIGURE C1-1




FDOT

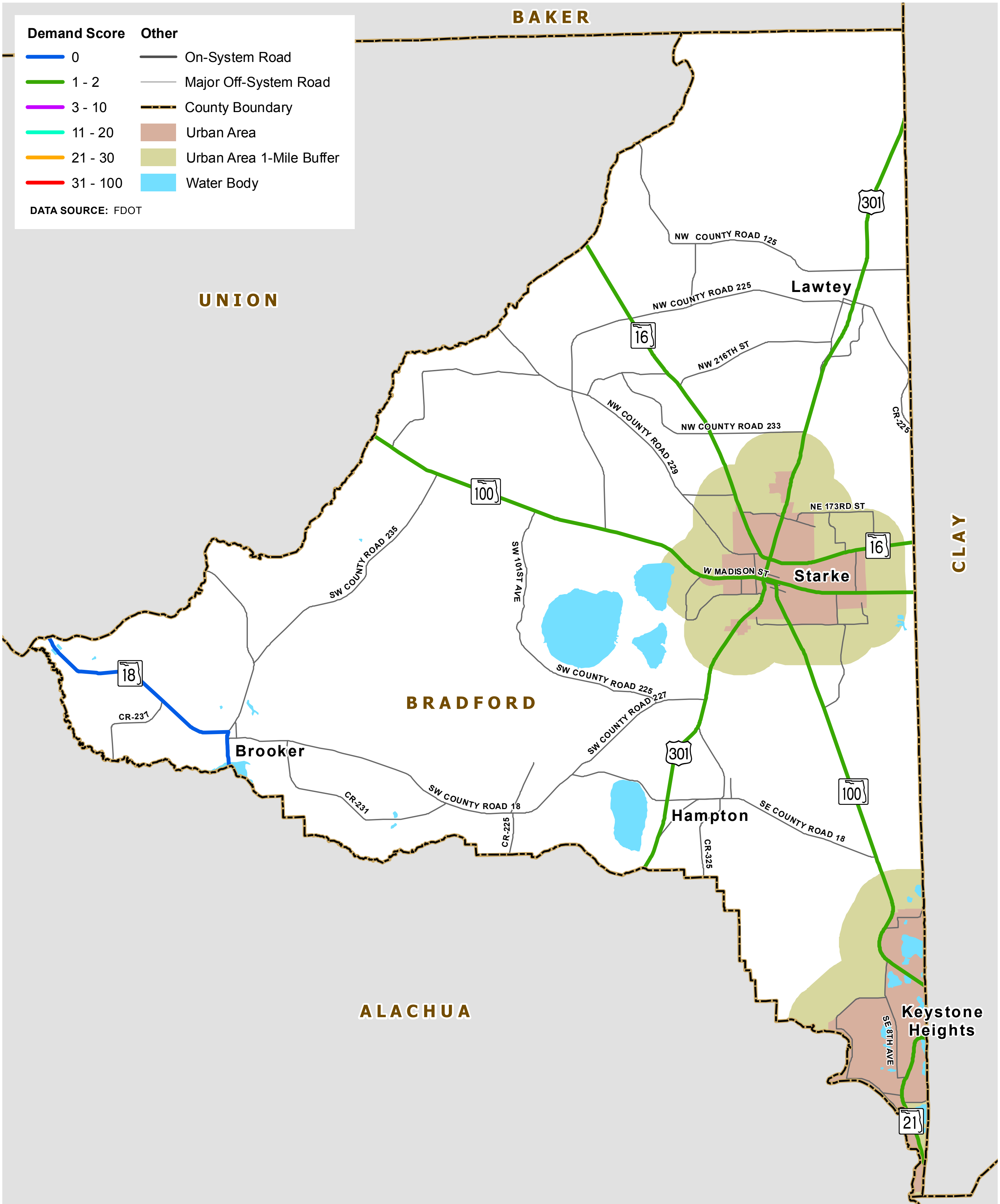
0 2.5 5
Miles

# YEAR 2010 ESTIMATED DEMAND

## BAKER COUNTY

FIGURE C1-2

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

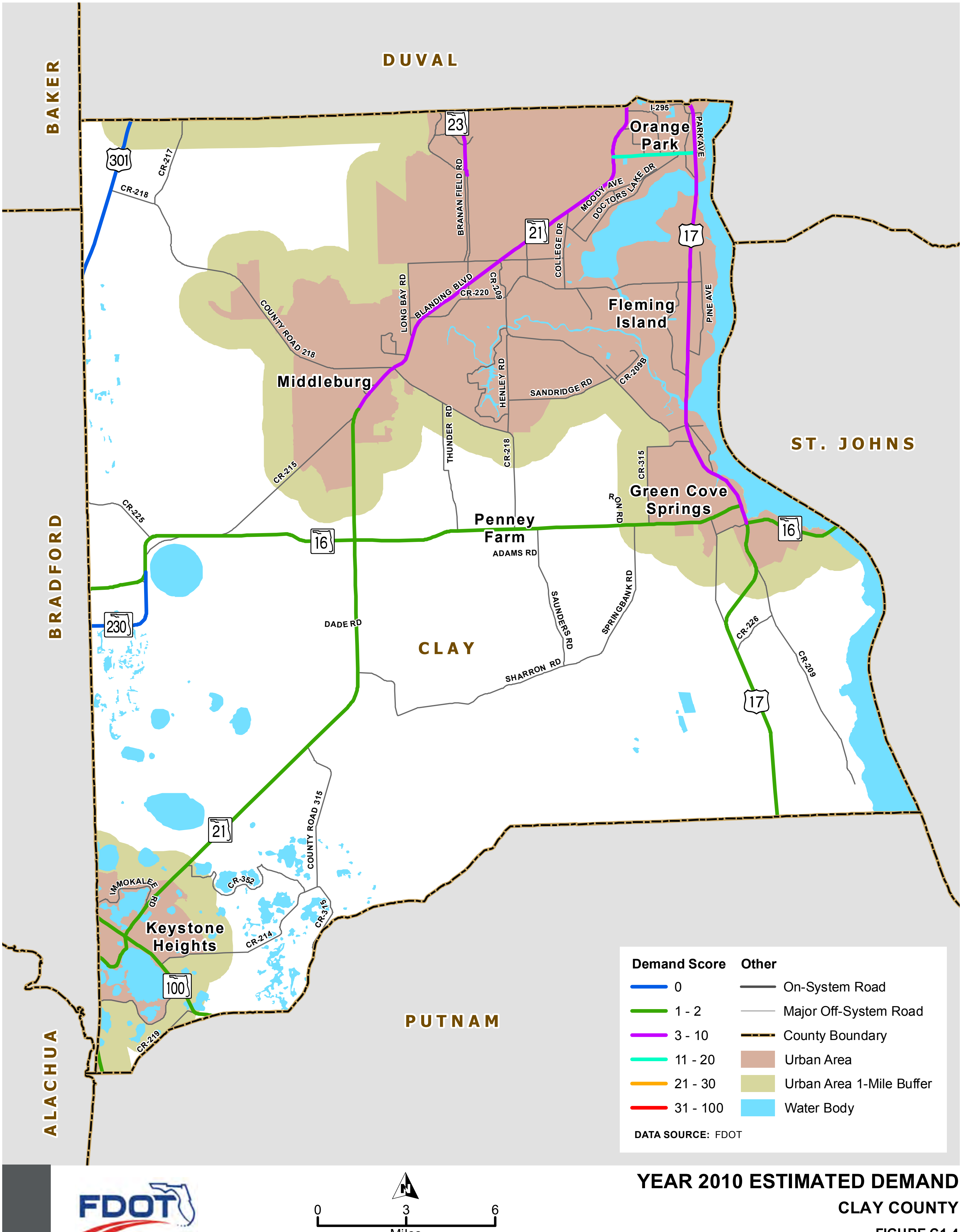



# YEAR 2010 ESTIMATED DEMAND

## BRADFORD COUNTY

FIGURE C1-3

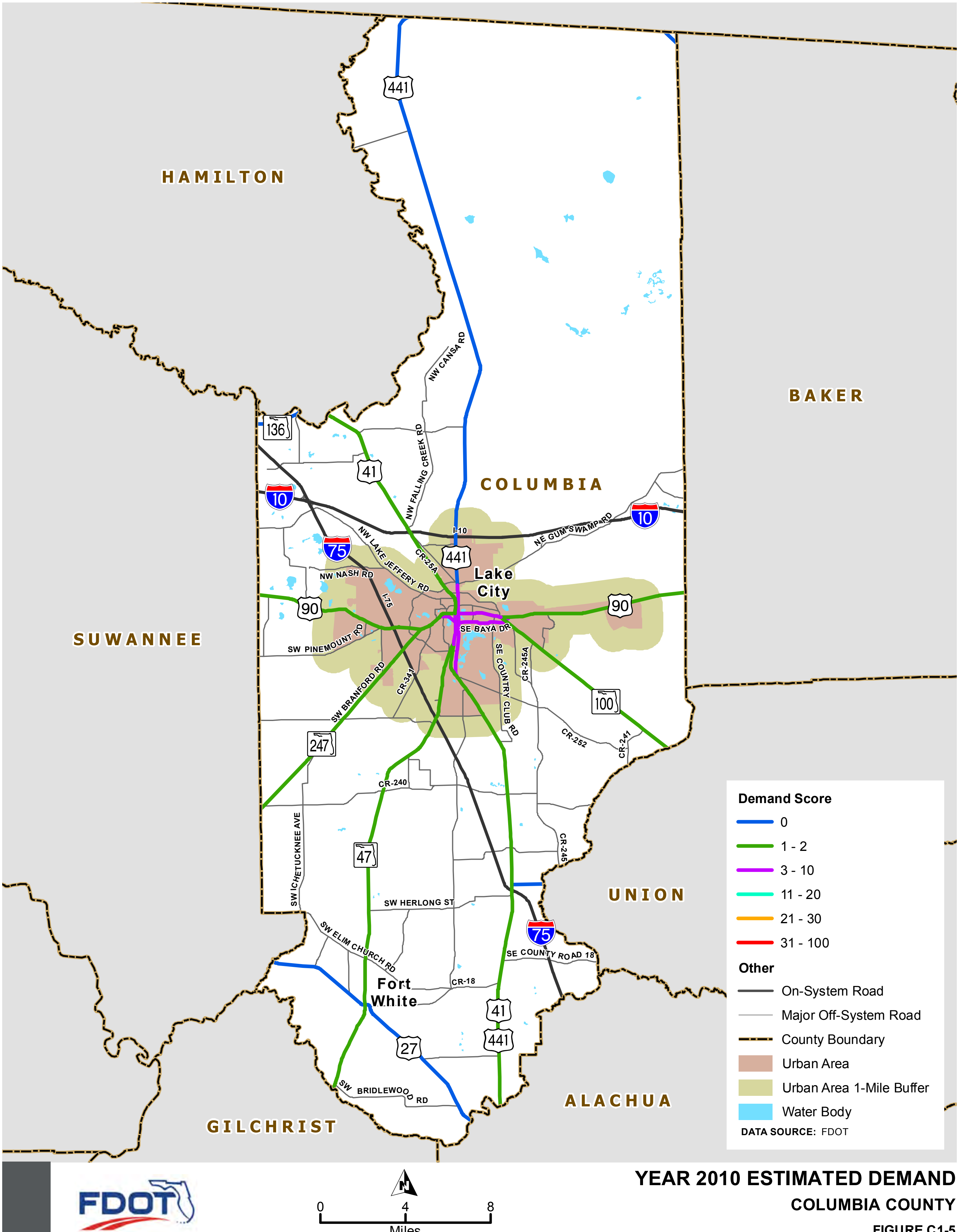
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




## YEAR 2010 ESTIMATED DEMAND

### CLAY COUNTY

**FIGURE C1-4**

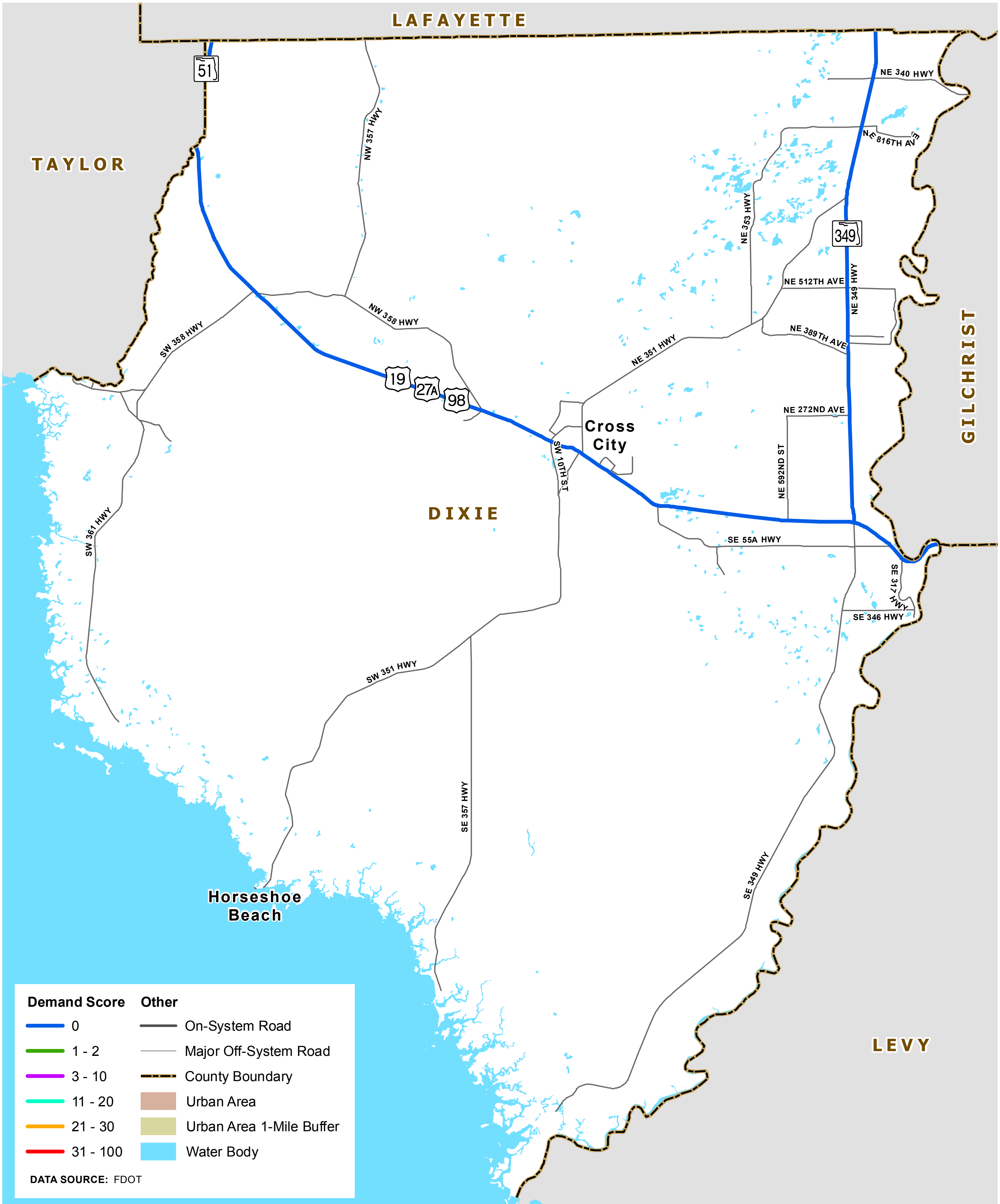



# YEAR 2010 ESTIMATED DEMAND

## COLUMBIA COUNTY

FIGURE C1-5

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY



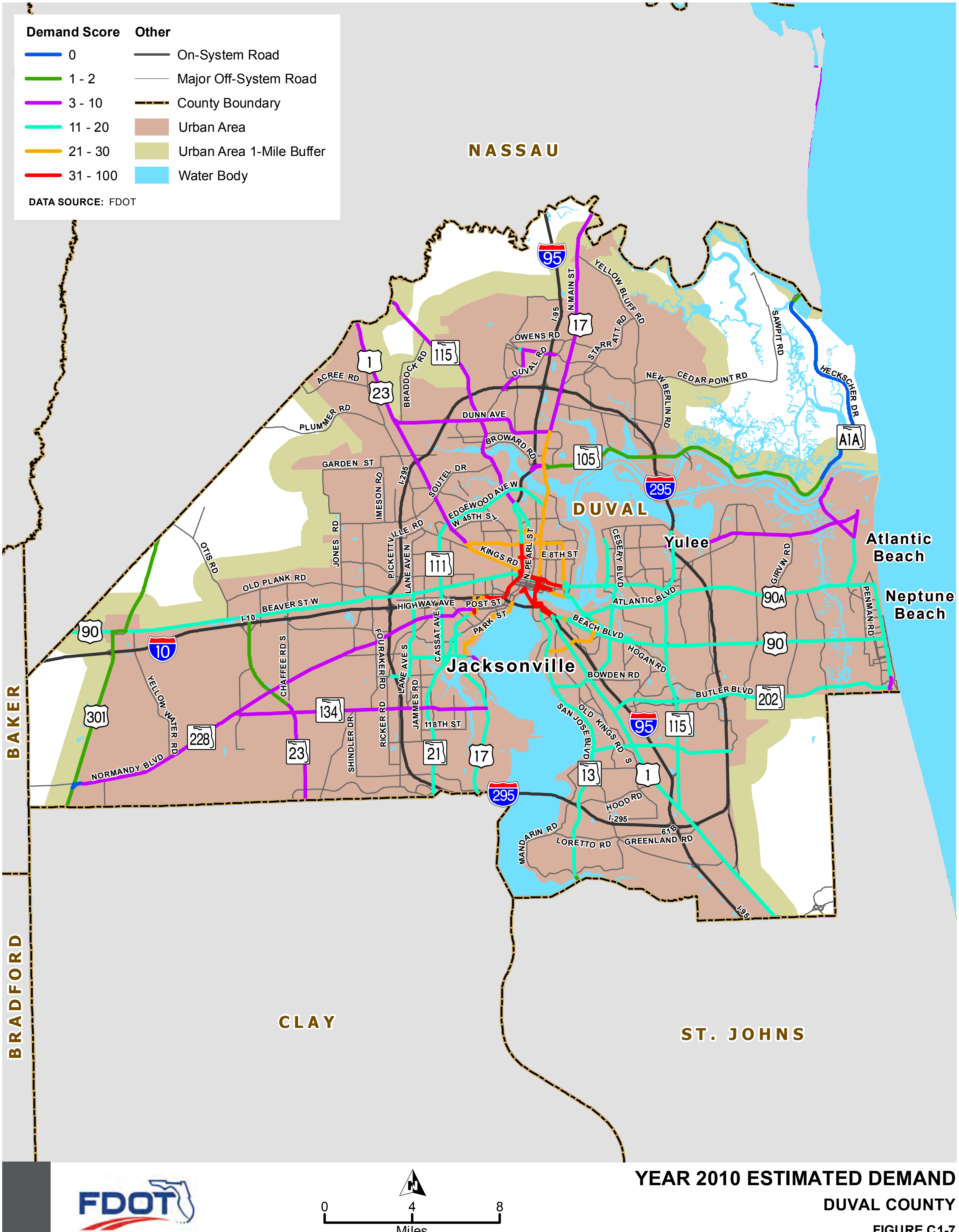

FDOT

0 2.5 5
Miles

**YEAR 2010 ESTIMATED DEMAND**

**DIXIE COUNTY**

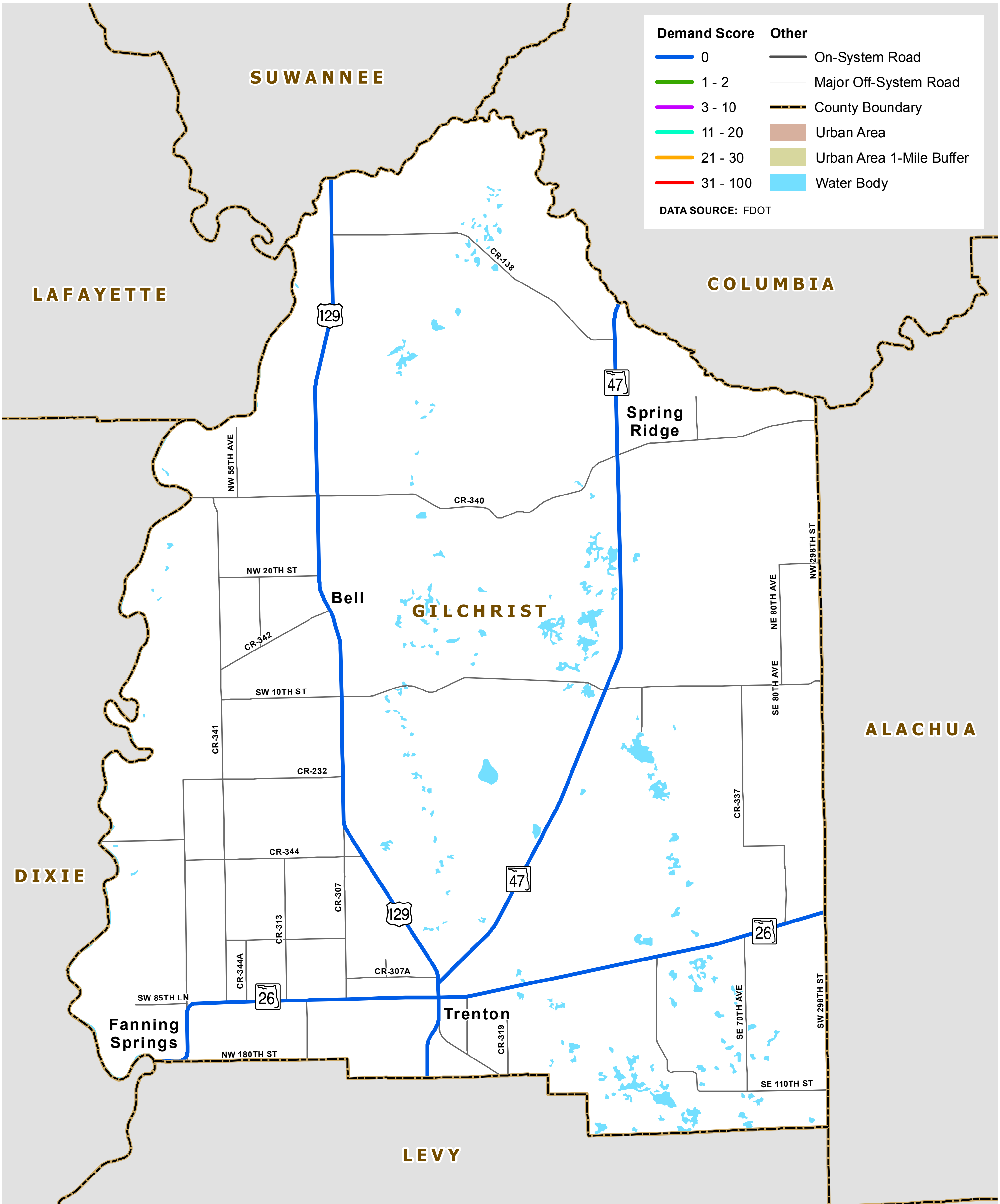
**FIGURE C1-6**




# YEAR 2010 ESTIMATED DEMAND

## DUVAL COUNTY

FIGURE C1-7

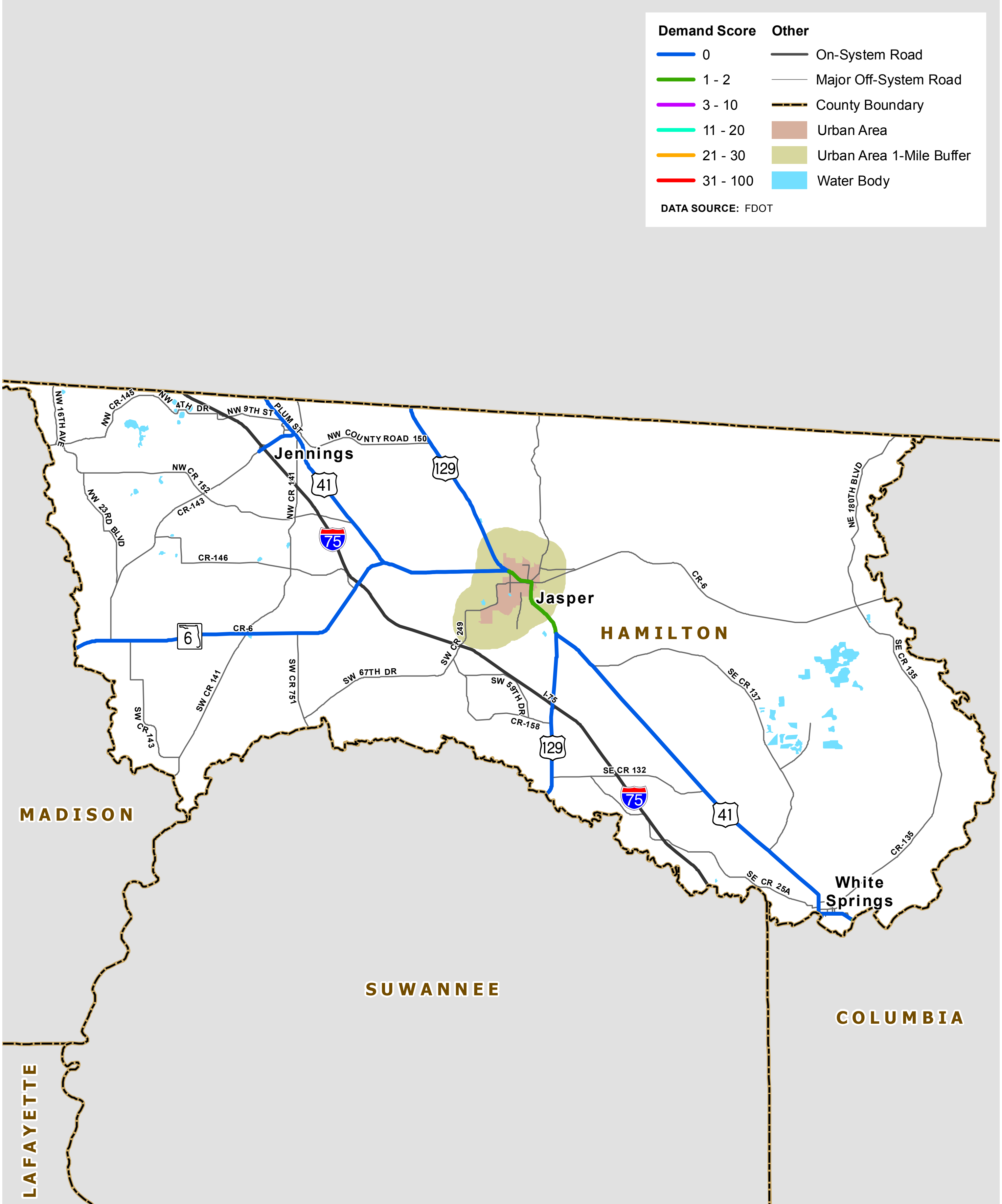



0 2 4
Miles

# YEAR 2010 ESTIMATED DEMAND

## GILCHRIST COUNTY

FIGURE C1-8

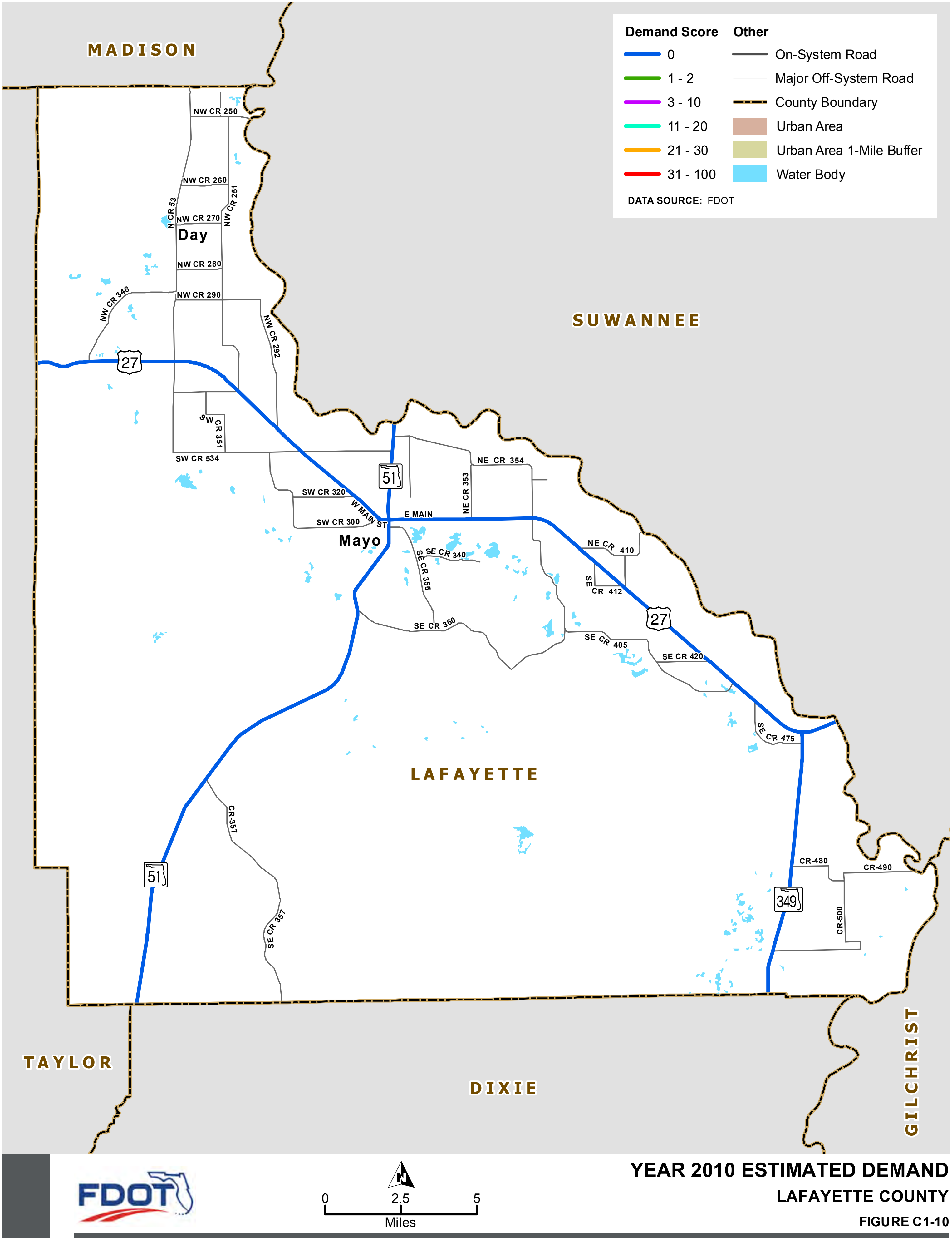



0 3.5 7
Miles

# YEAR 2010 ESTIMATED DEMAND

## HAMILTON COUNTY

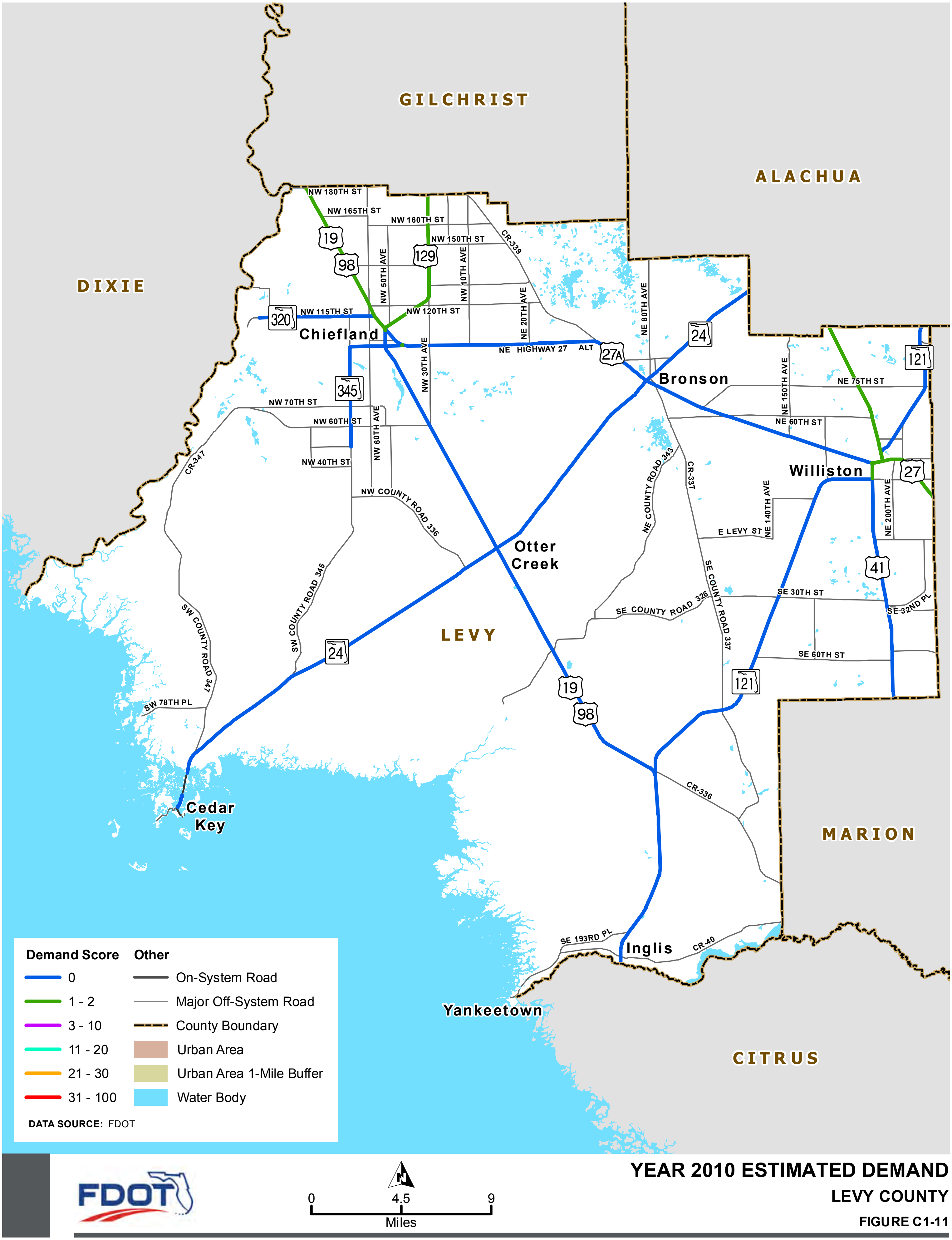
FIGURE C1-9




# YEAR 2010 ESTIMATED DEMAND

## LAFAYETTE COUNTY

FIGURE C1-10

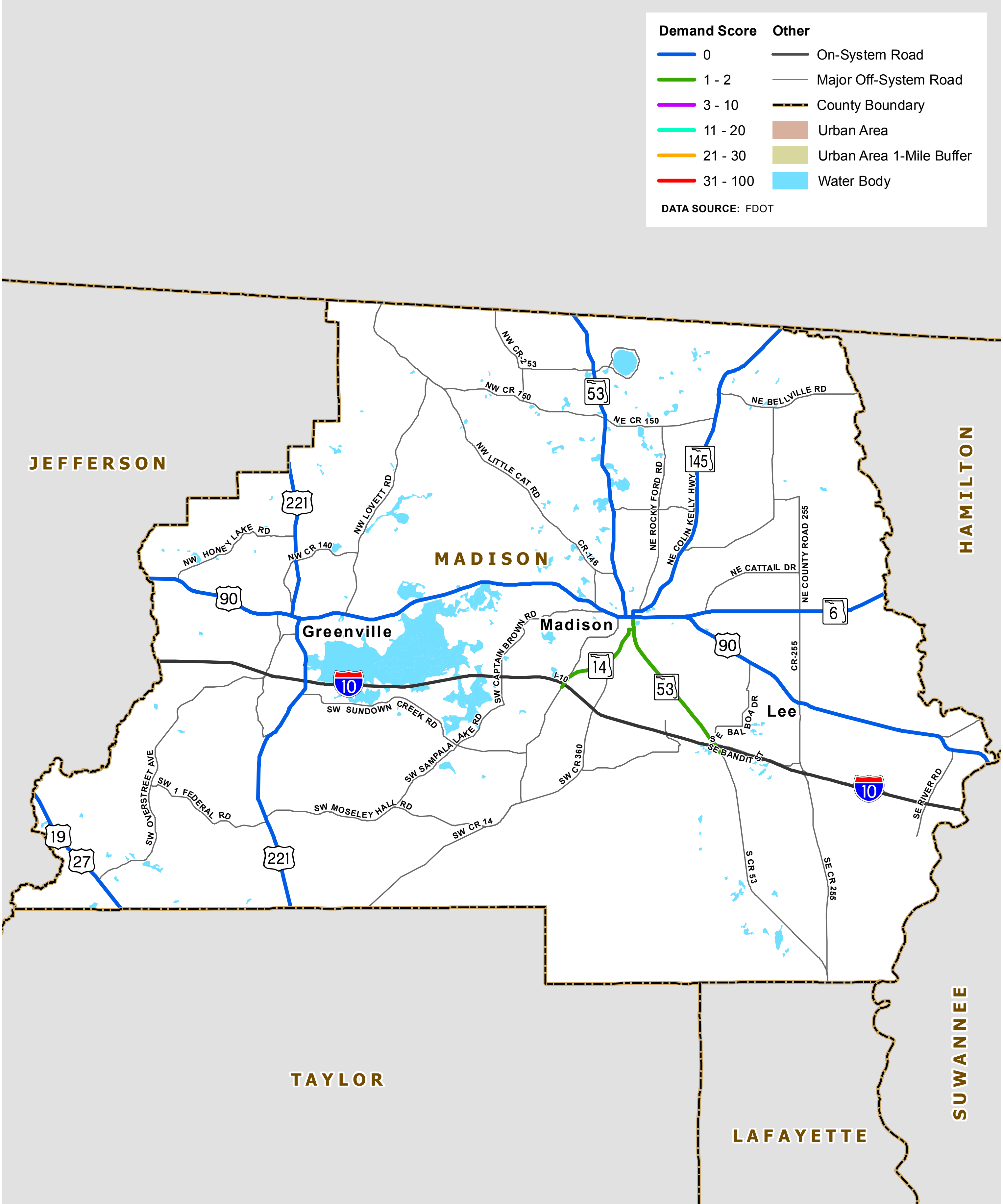



FDOT

# YEAR 2010 ESTIMATED DEMAND

LEVY COUNTY

FIGURE C1-11

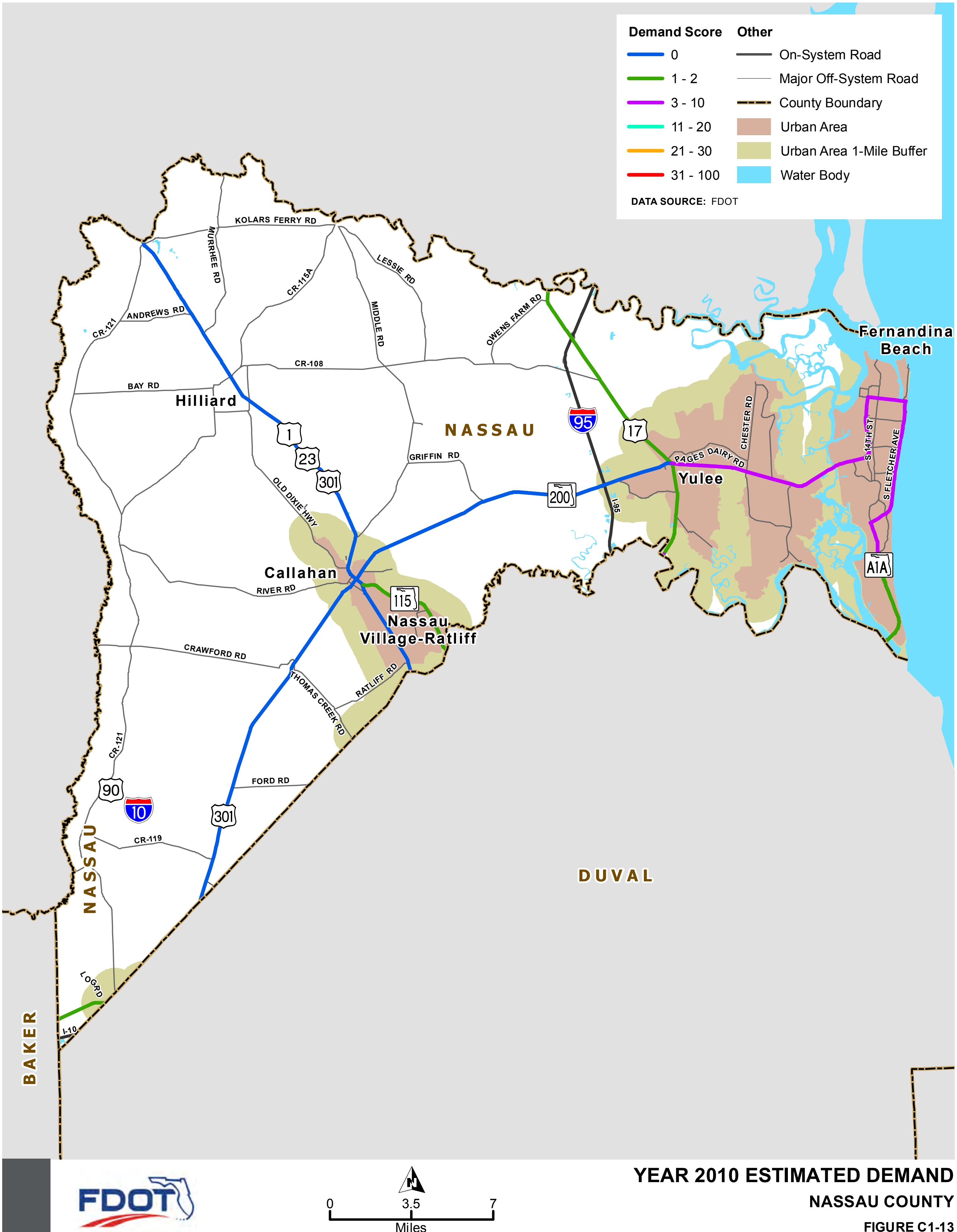



0 3.5 7
Miles

# YEAR 2010 ESTIMATED DEMAND

## MADISON COUNTY

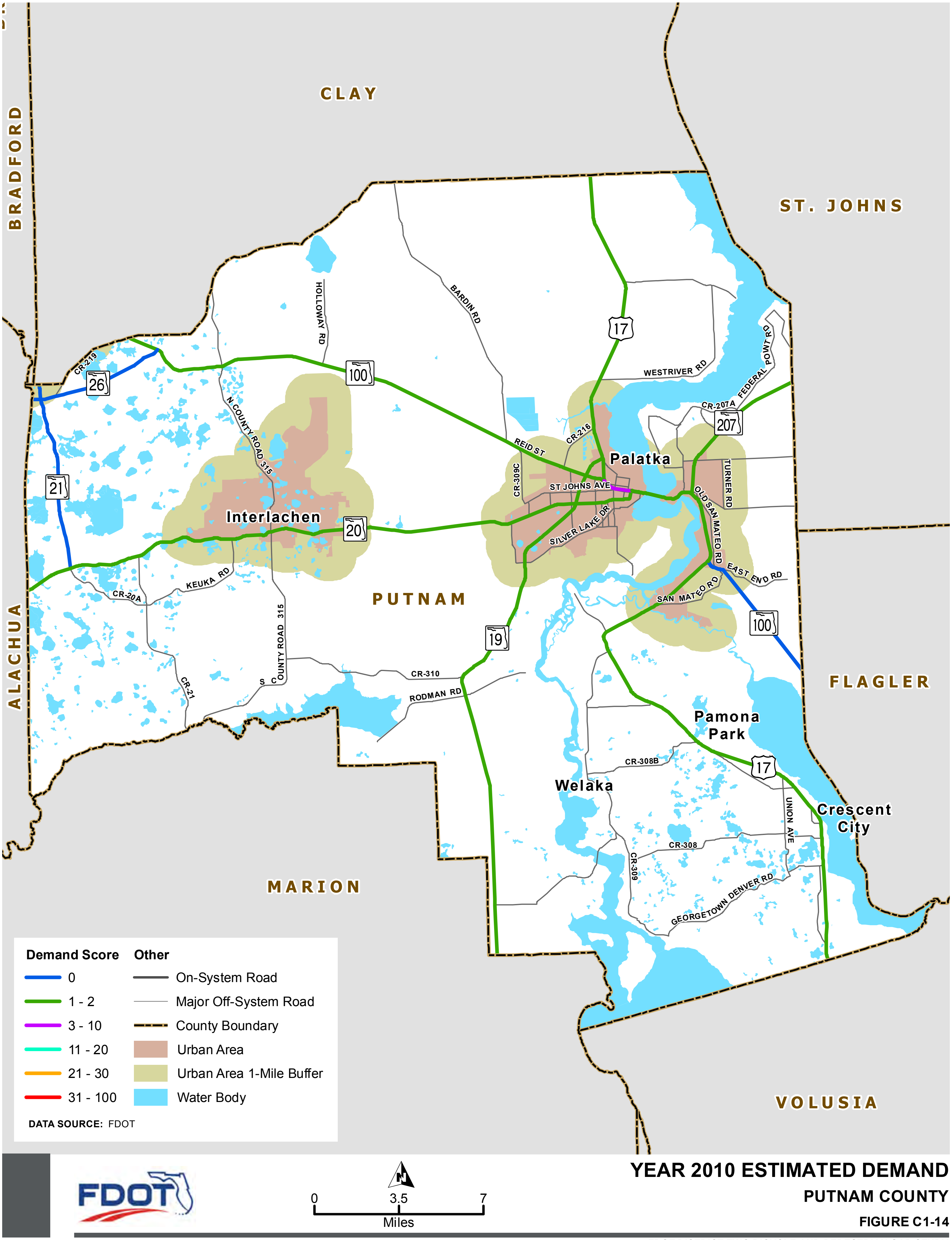
FIGURE C1-12




## YEAR 2010 ESTIMATED DEMAND

### NASSAU COUNTY

**FIGURE C1-13**

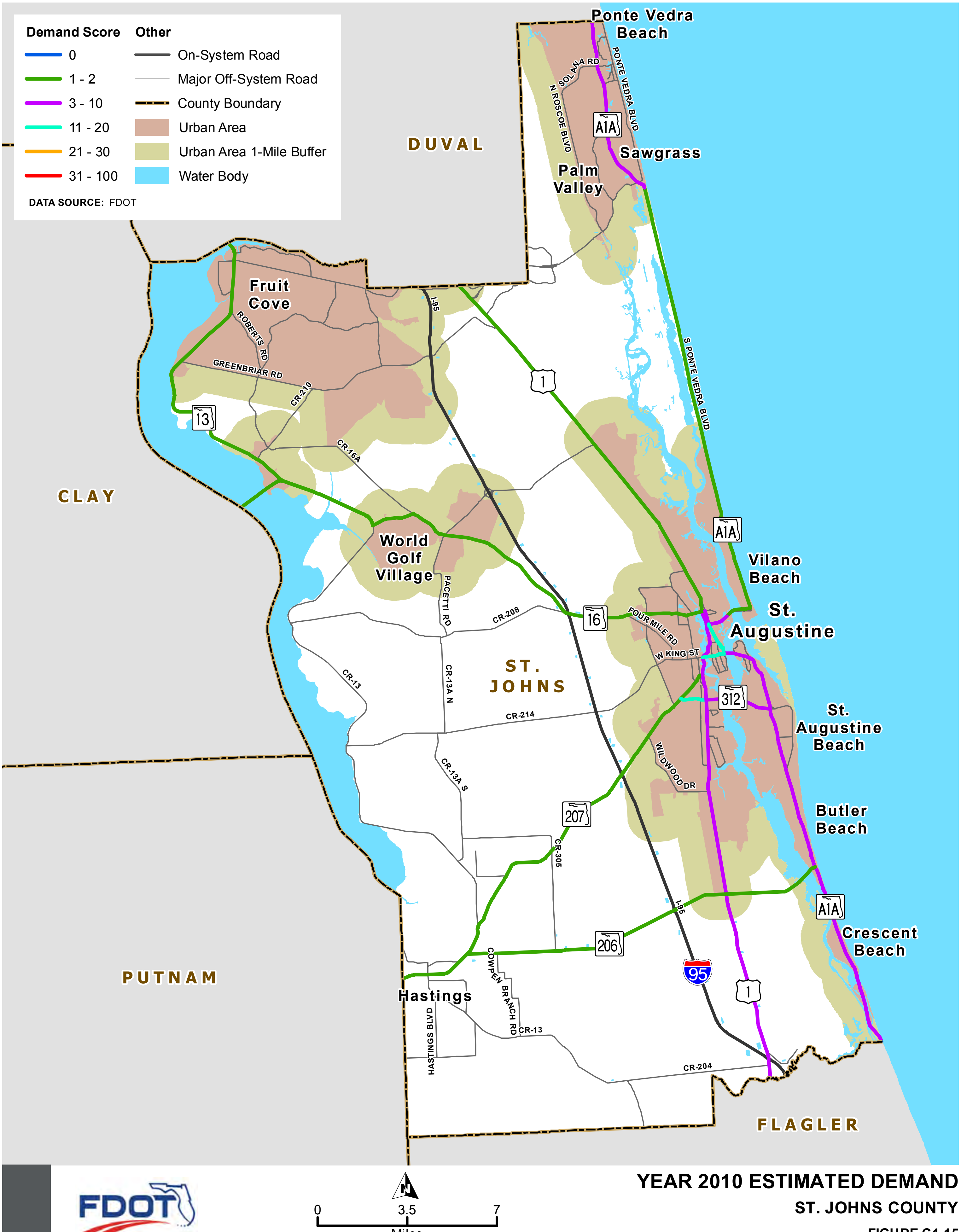



FDOT

## YEAR 2010 ESTIMATED DEMAND

PUTNAM COUNTY

FIGURE C1-14

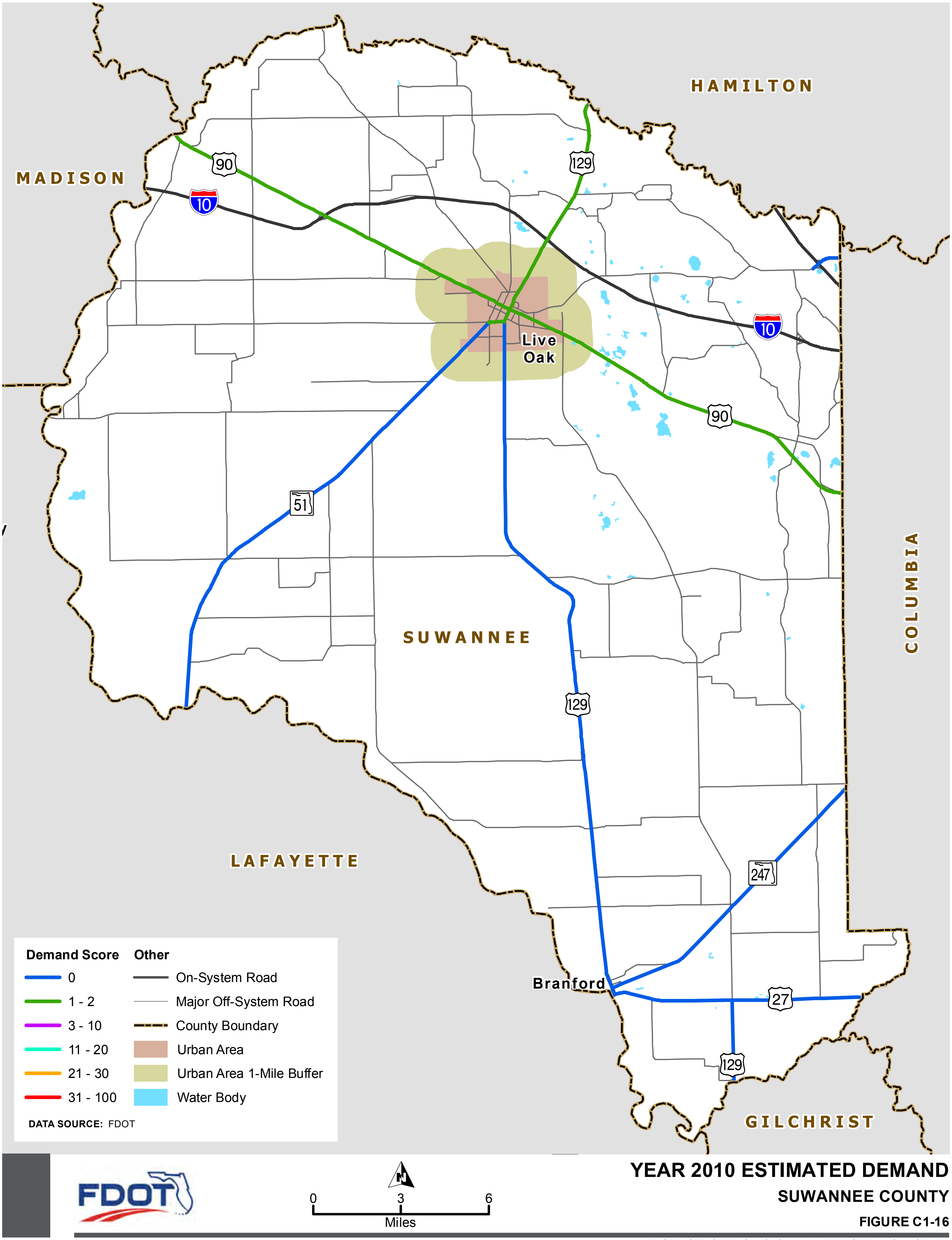



# YEAR 2010 ESTIMATED DEMAND

## ST. JOHNS COUNTY

FIGURE C1-15

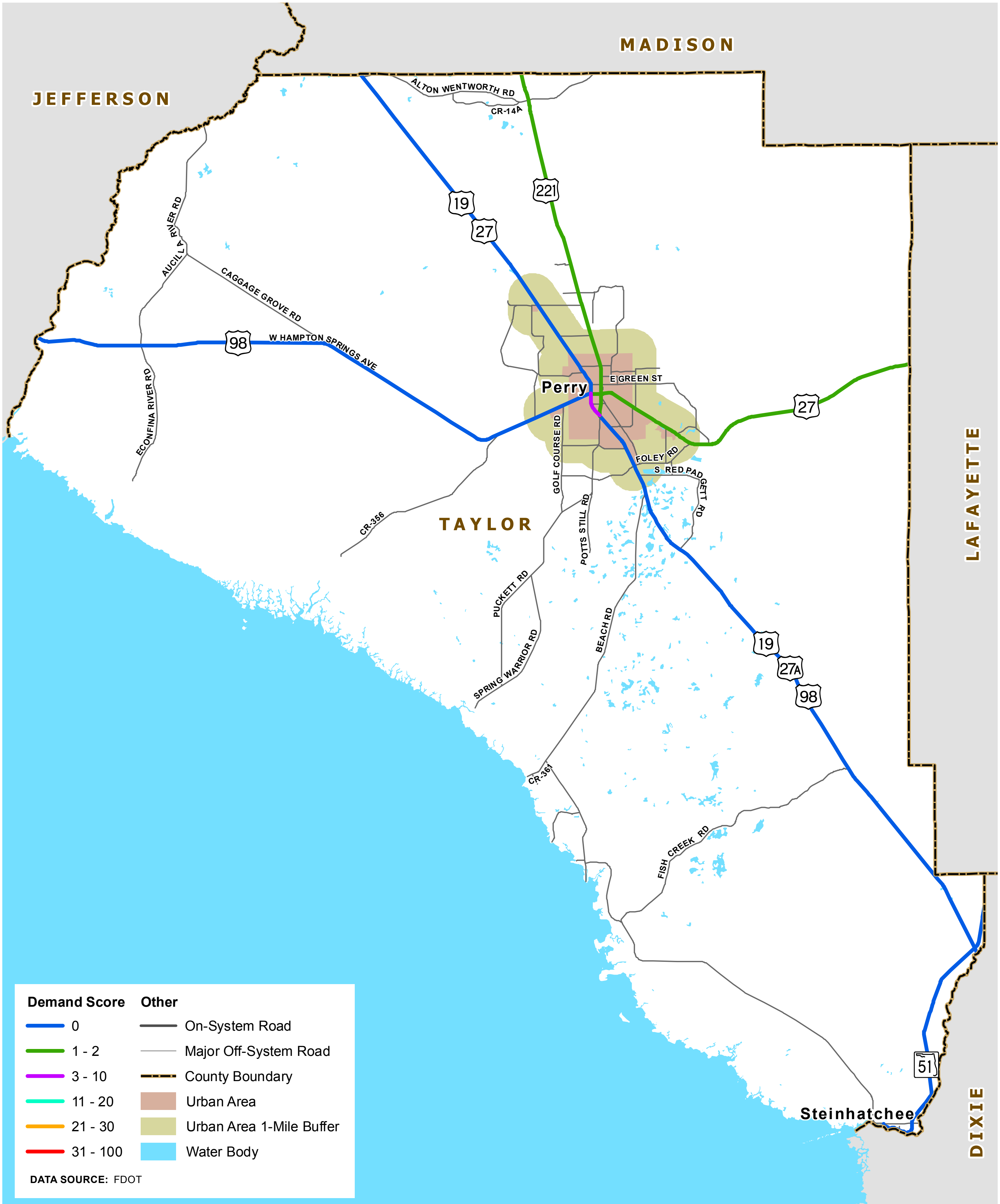
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# YEAR 2010 ESTIMATED DEMAND

## SUWANNEE COUNTY

FIGURE C1-16



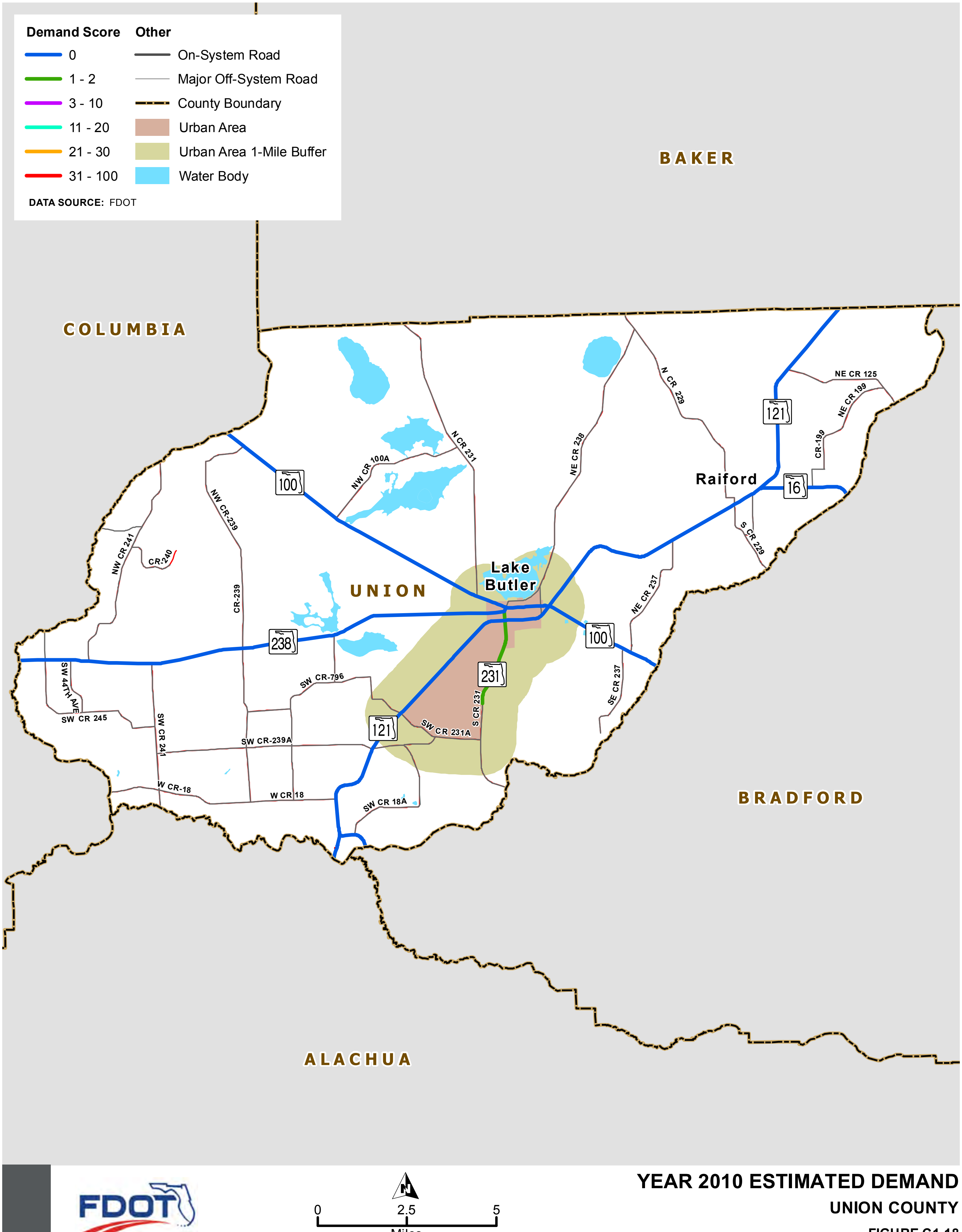

FDOT

0 3.5 7
Miles

# YEAR 2010 ESTIMATED DEMAND

## TAYLOR COUNTY

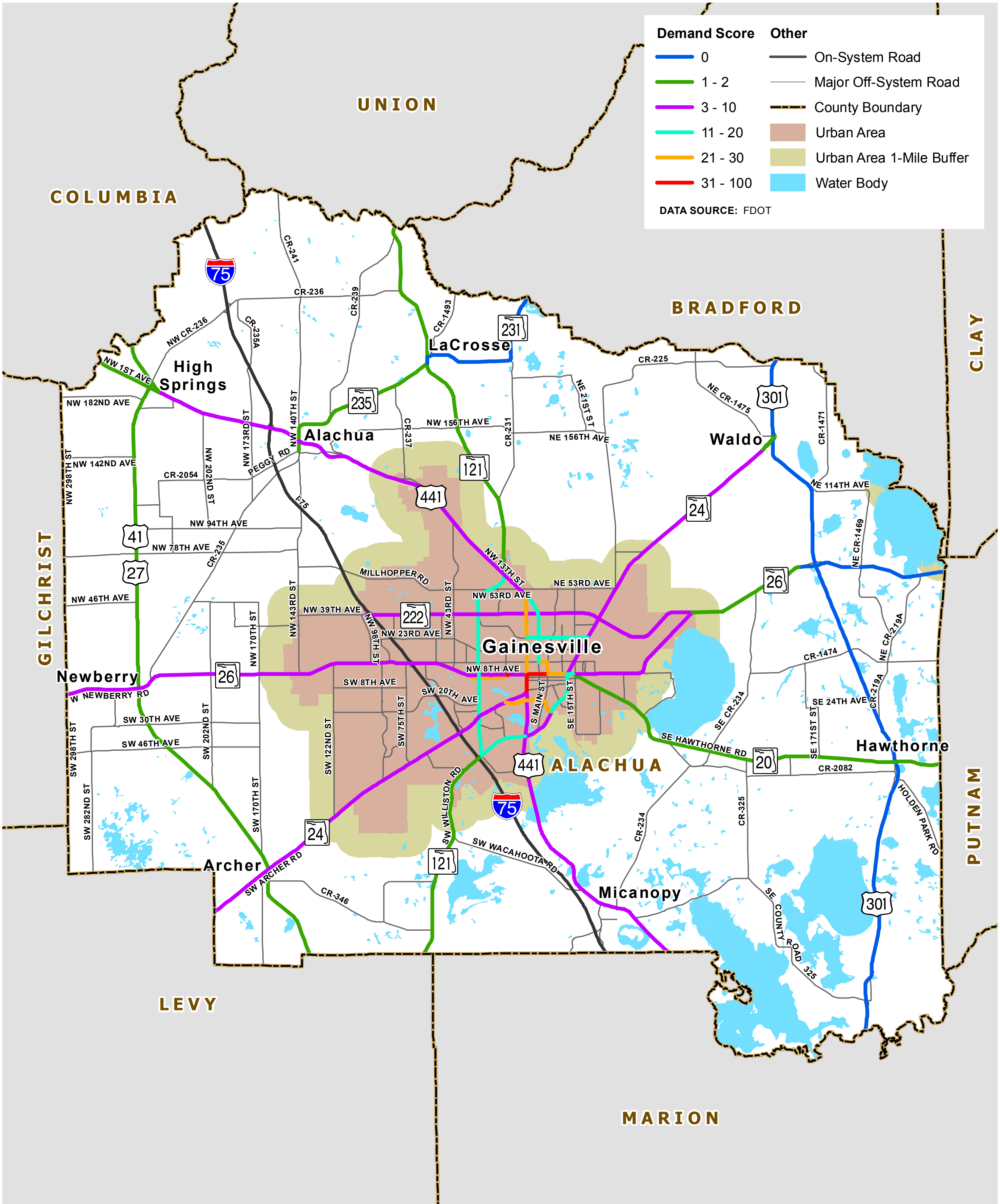
FIGURE C1-17




# YEAR 2010 ESTIMATED DEMAND

## UNION COUNTY

**FIGURE C1-18**

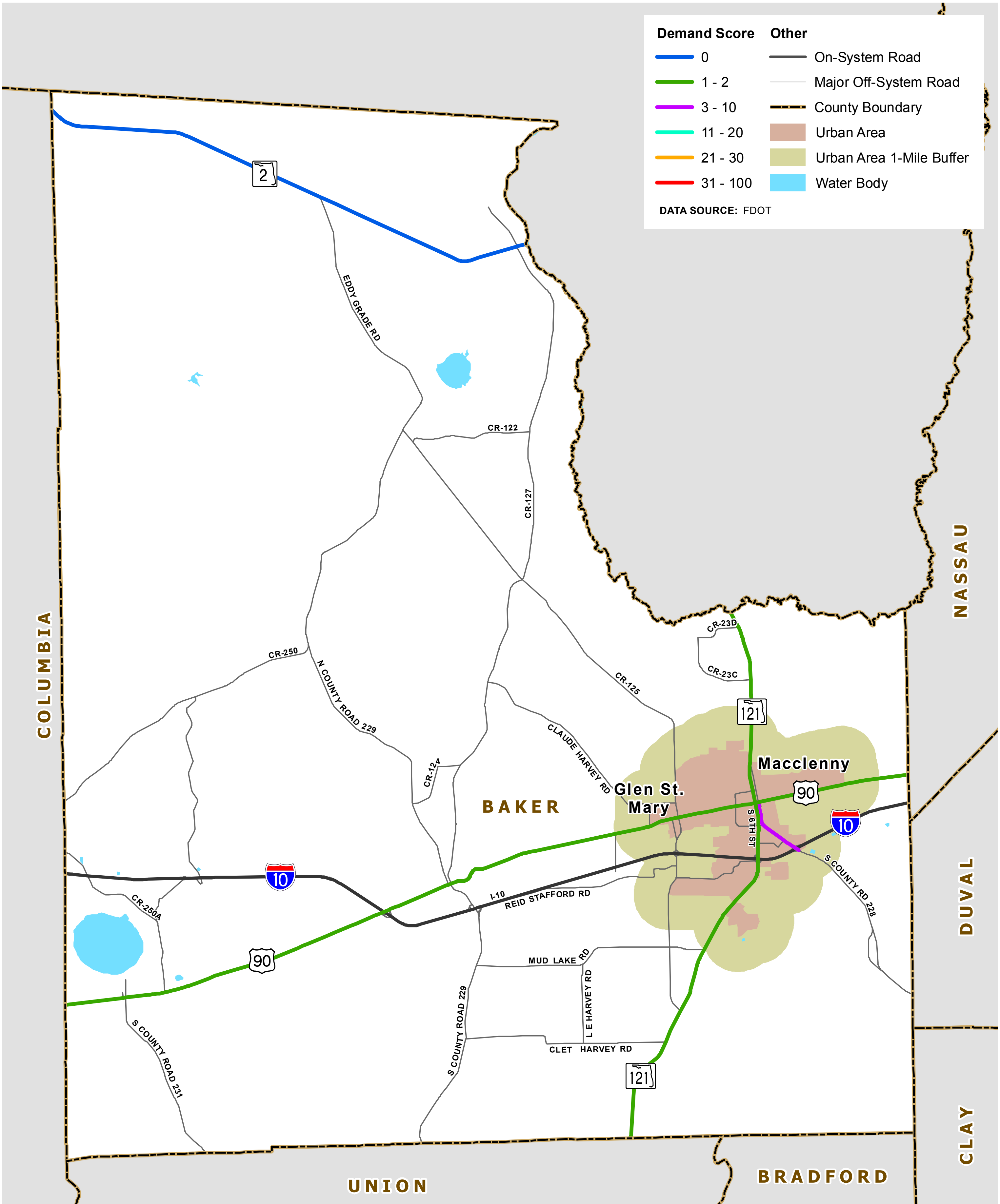



0 3.5 7
Miles

# YEAR 2040 POTENTIAL DEMAND

## ALACHUA COUNTY

FIGURE C2-1



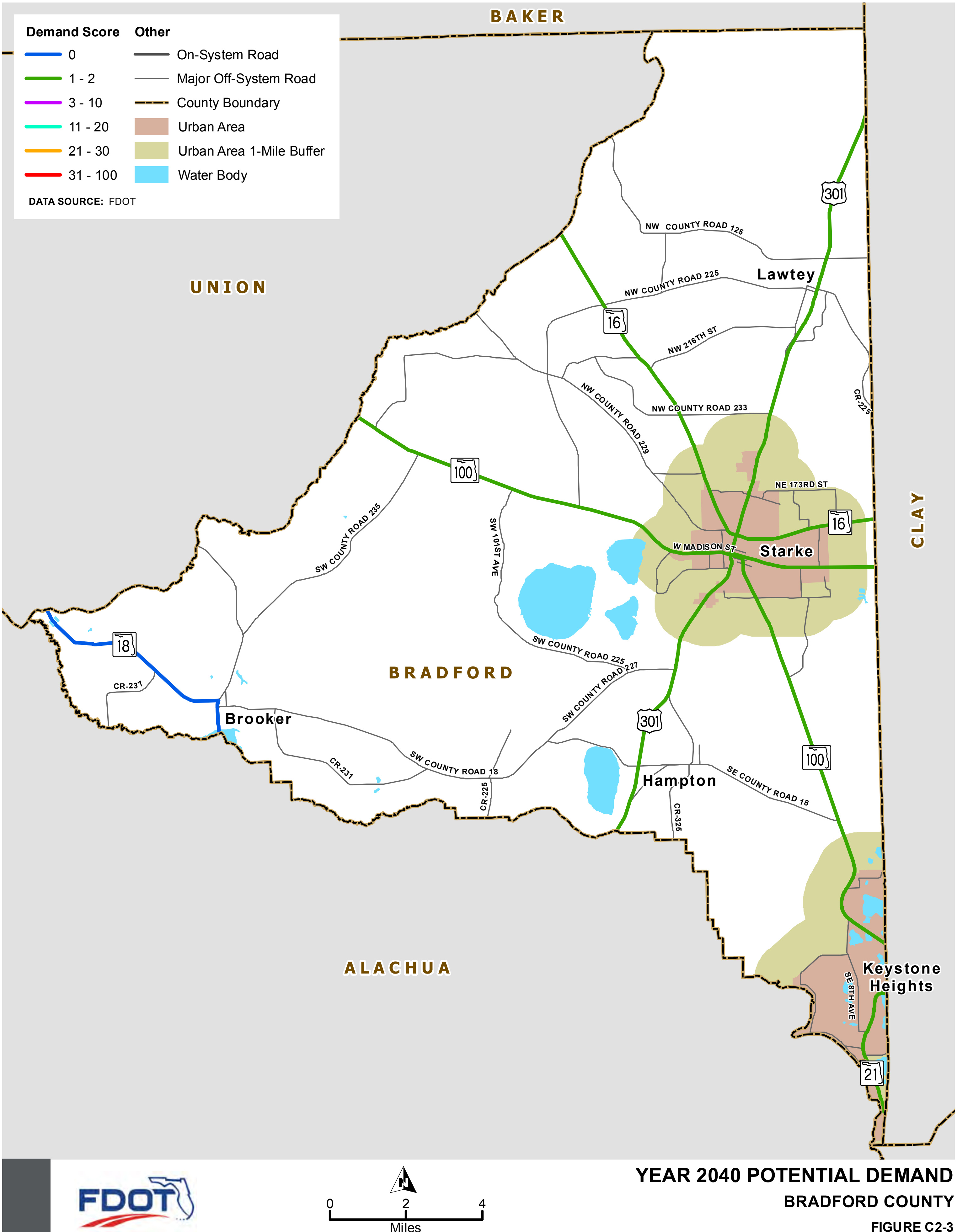

0 2.5 5
Miles

FDOT

# YEAR 2040 POTENTIAL DEMAND

## BAKER COUNTY

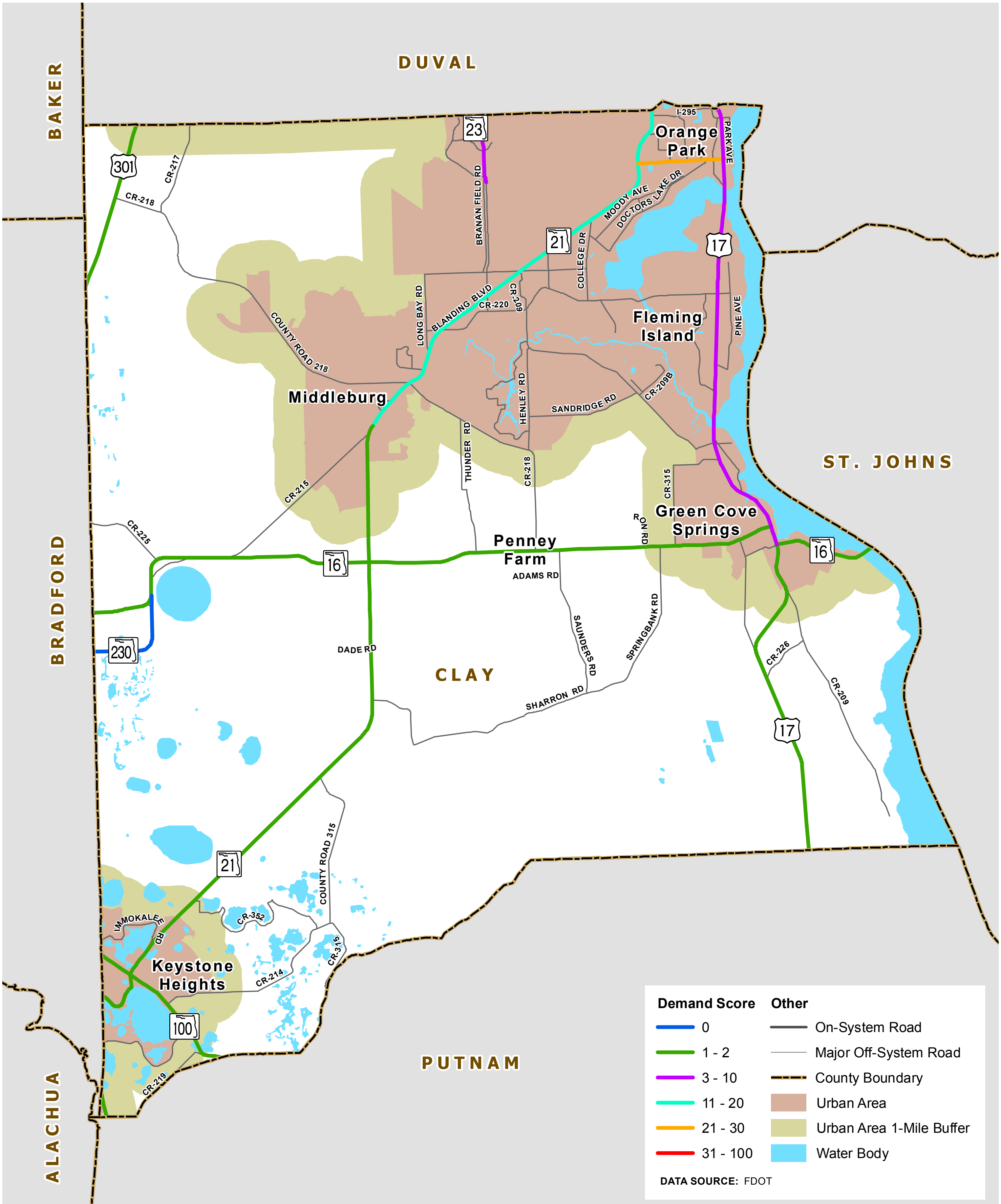
**FIGURE C2-2**




# YEAR 2040 POTENTIAL DEMAND

## BRADFORD COUNTY

FIGURE C2-3




FDOT

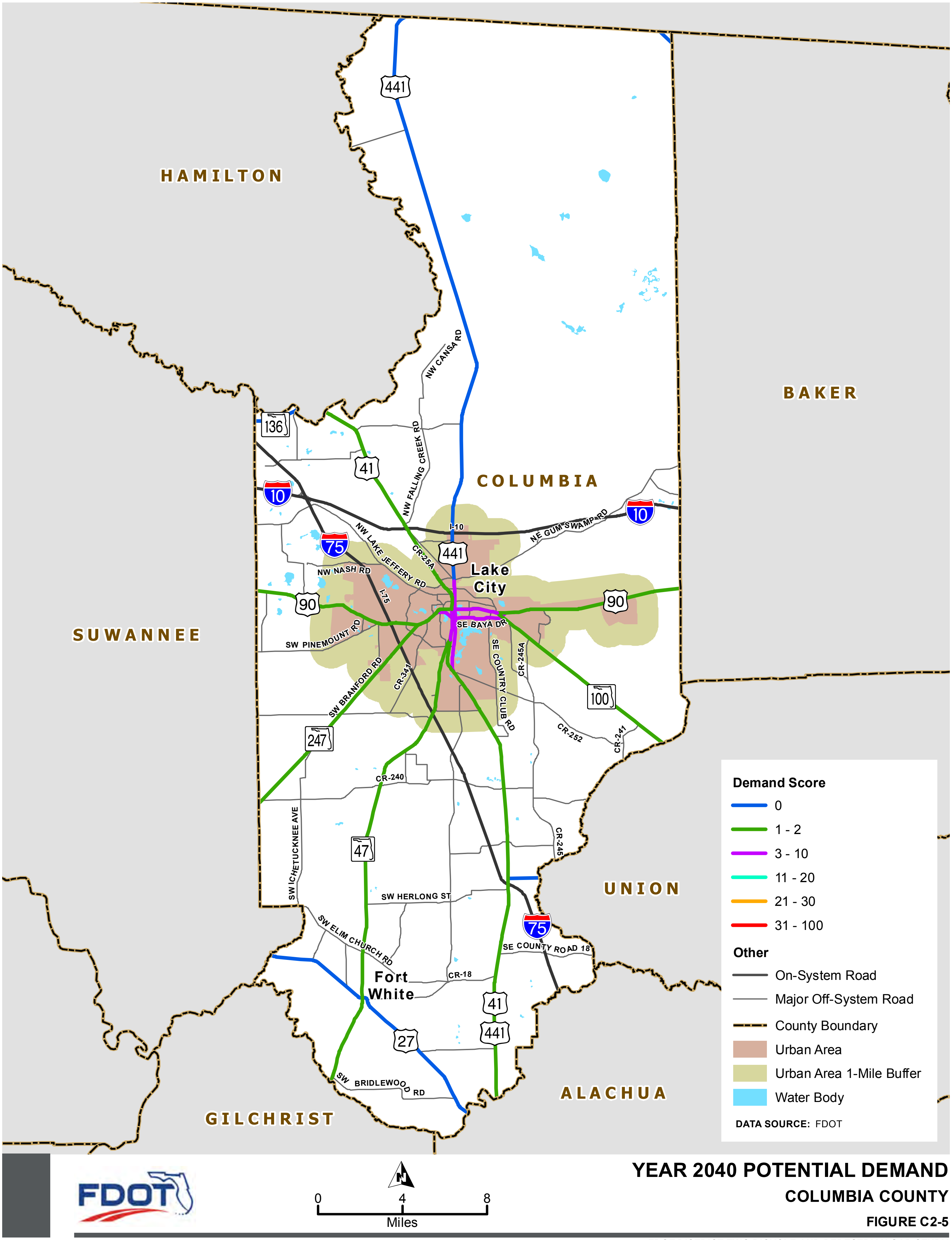
0 3 6
Miles

# YEAR 2040 POTENTIAL DEMAND

## CLAY COUNTY

FIGURE C2-4

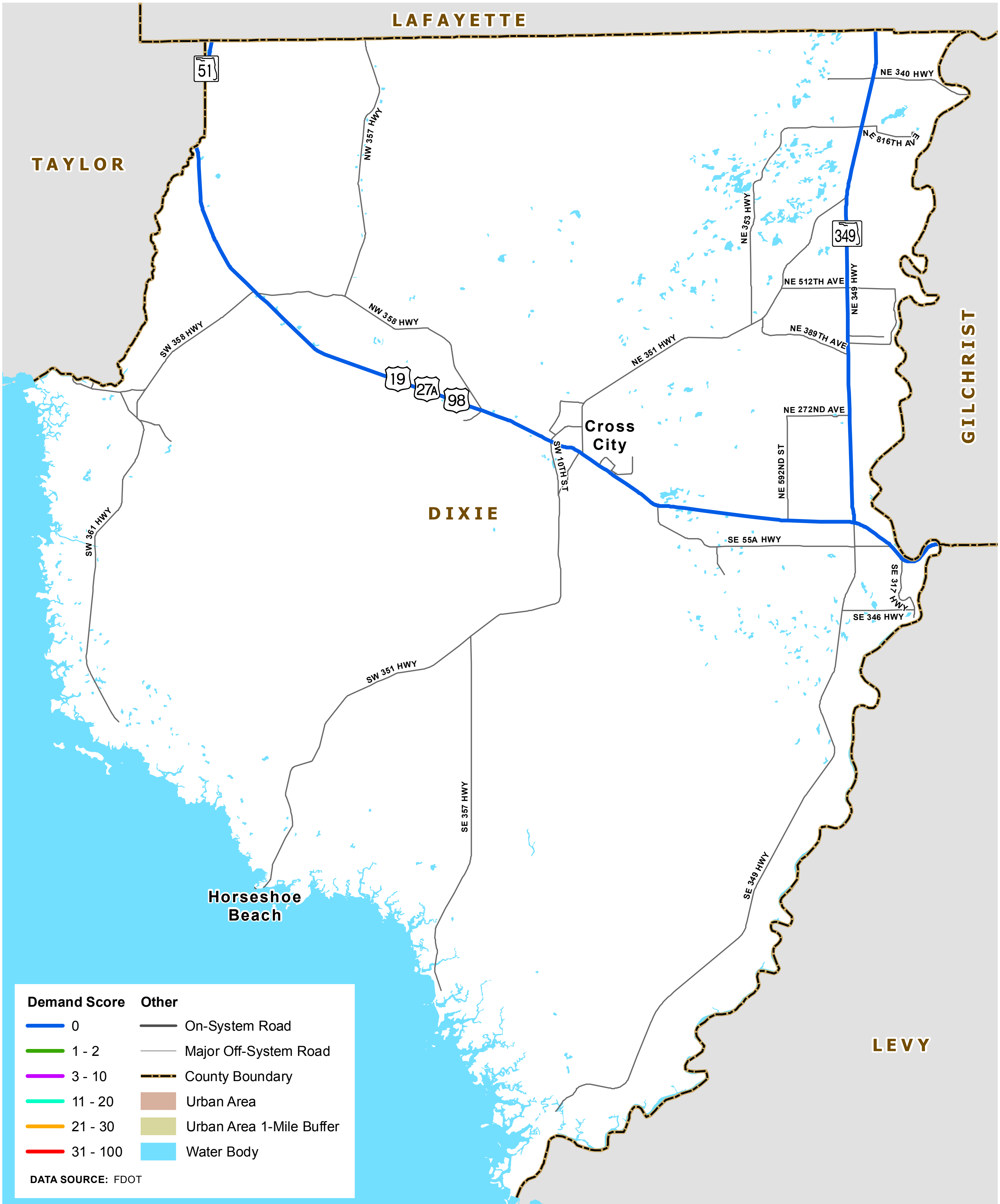
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# YEAR 2040 POTENTIAL DEMAND

## COLUMBIA COUNTY

FIGURE C2-5

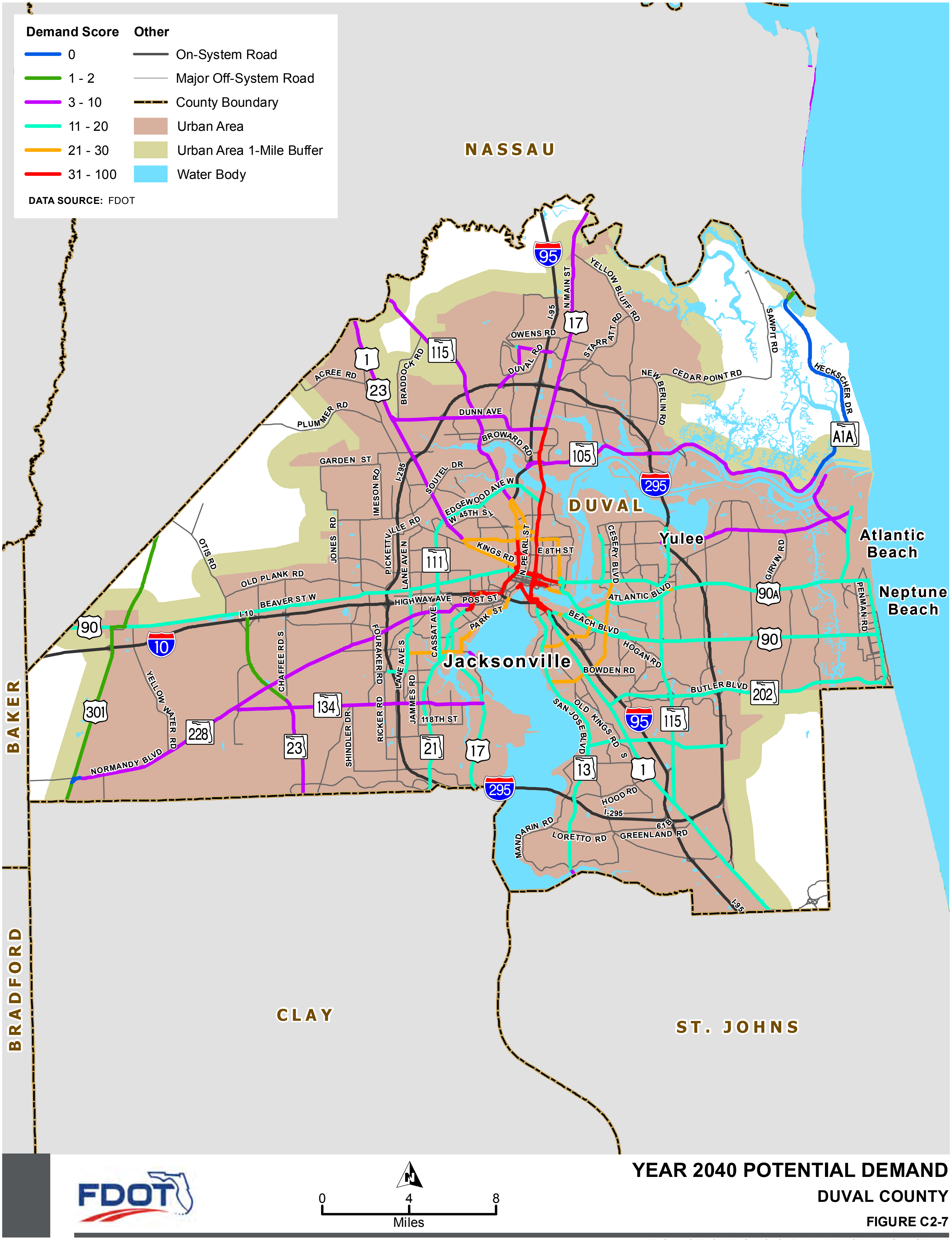



FDOT

## YEAR 2040 POTENTIAL DEMAND

### DIXIE COUNTY

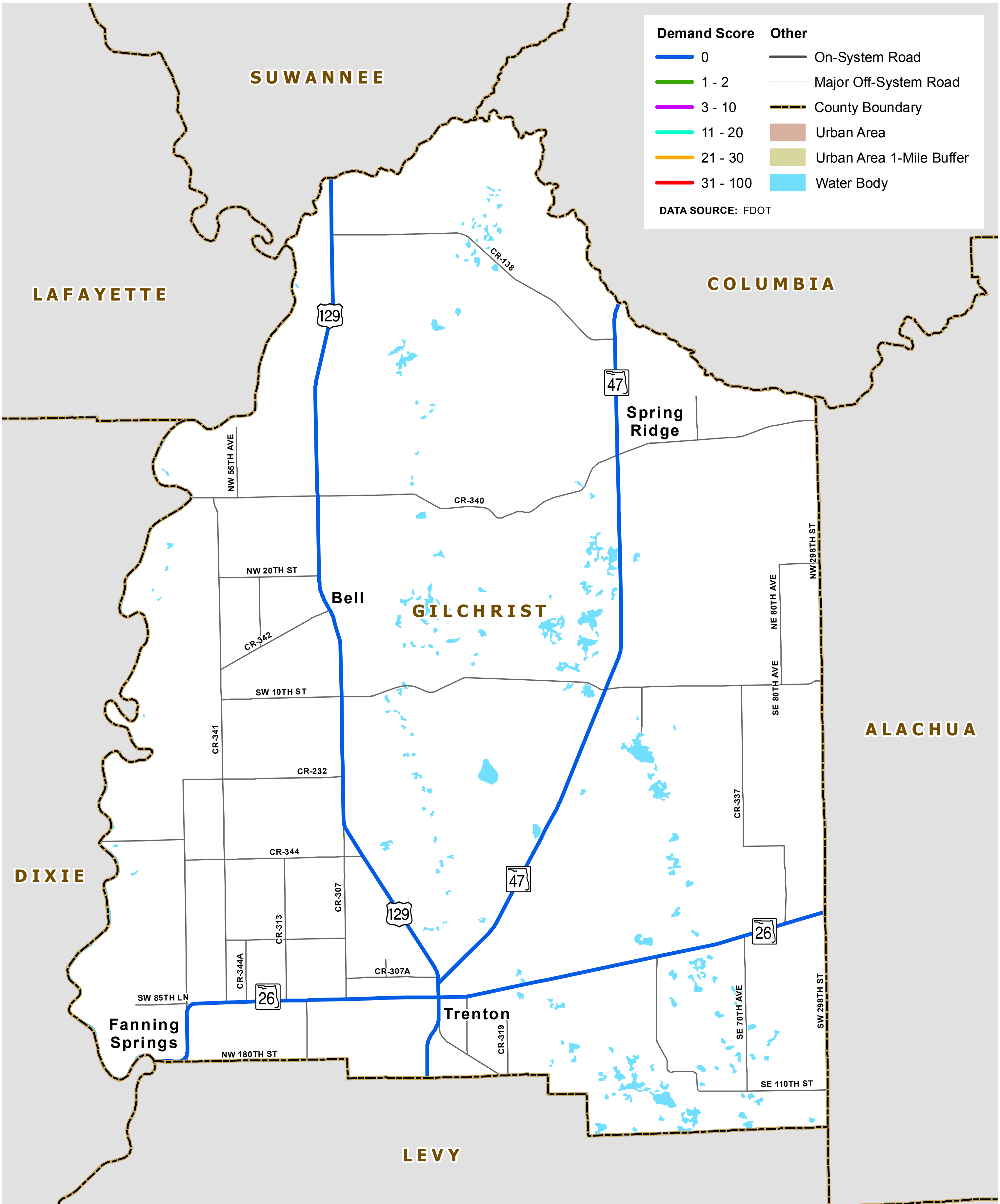
FIGURE C2-6




# YEAR 2040 POTENTIAL DEMAND

## DUVAL COUNTY

FIGURE C2-7

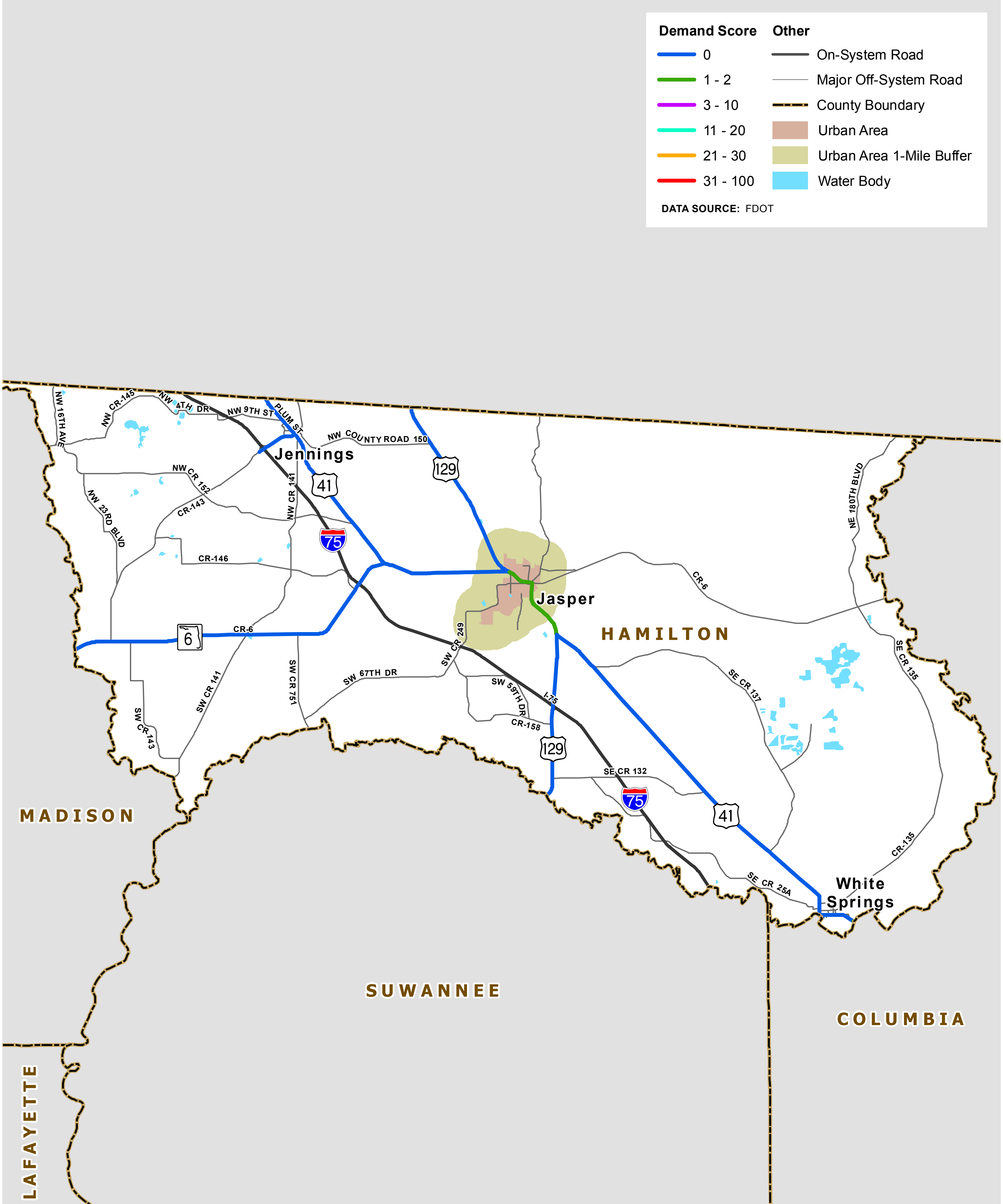



FDOT

# YEAR 2040 POTENTIAL DEMAND

## GILCHRIST COUNTY

FIGURE C2-8



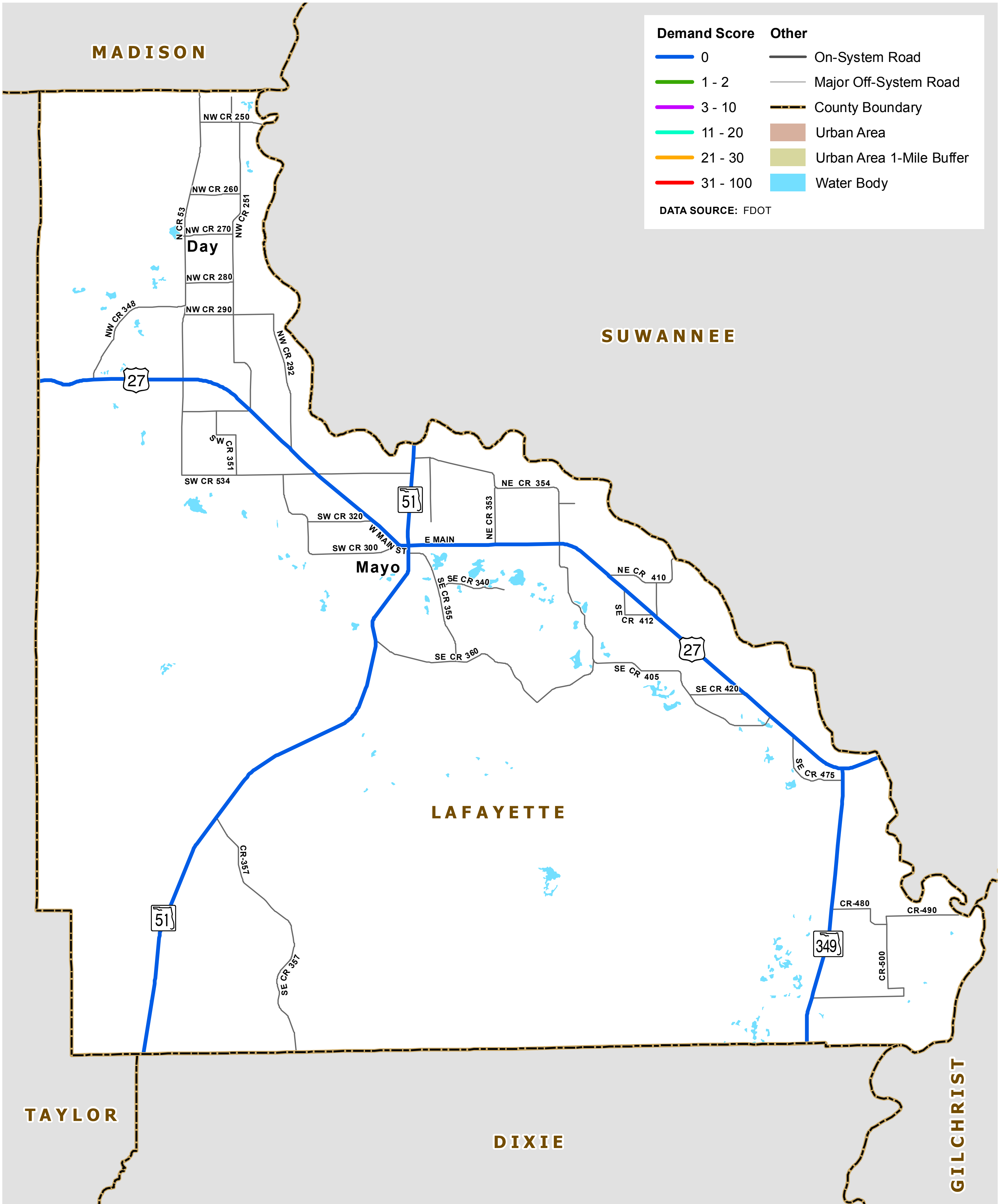

# YEAR 2040 POTENTIAL DEMAND

## HAMILTON COUNTY

FIGURE C2-9

0 3.5 7
Miles

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY



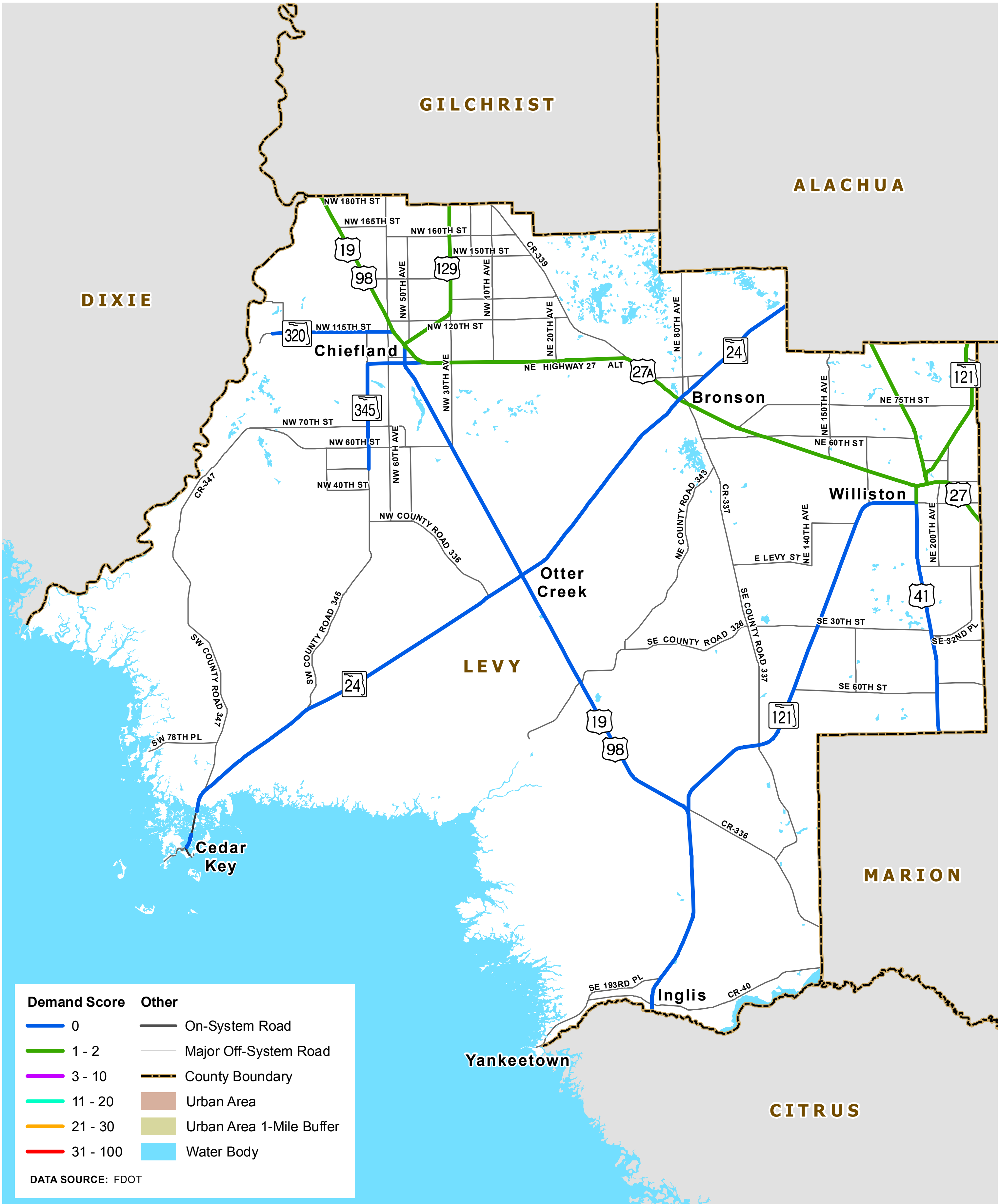

0
2.5
5
Miles

# YEAR 2040 POTENTIAL DEMAND

## LAFAYETTE COUNTY

FIGURE C2-10

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

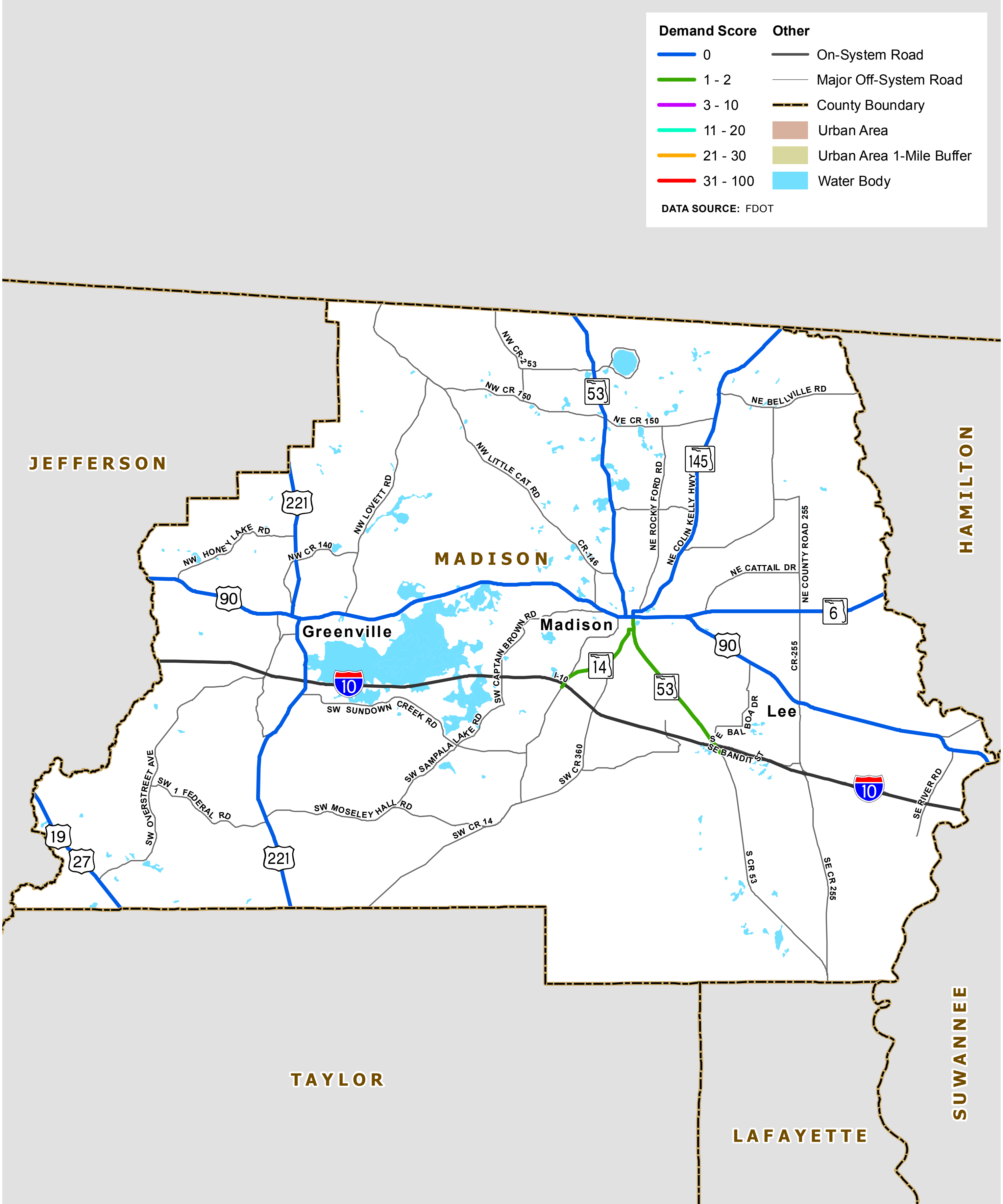



0 4.5 9
Miles

# YEAR 2040 POTENTIAL DEMAND

## LEVY COUNTY

**FIGURE C2-11**

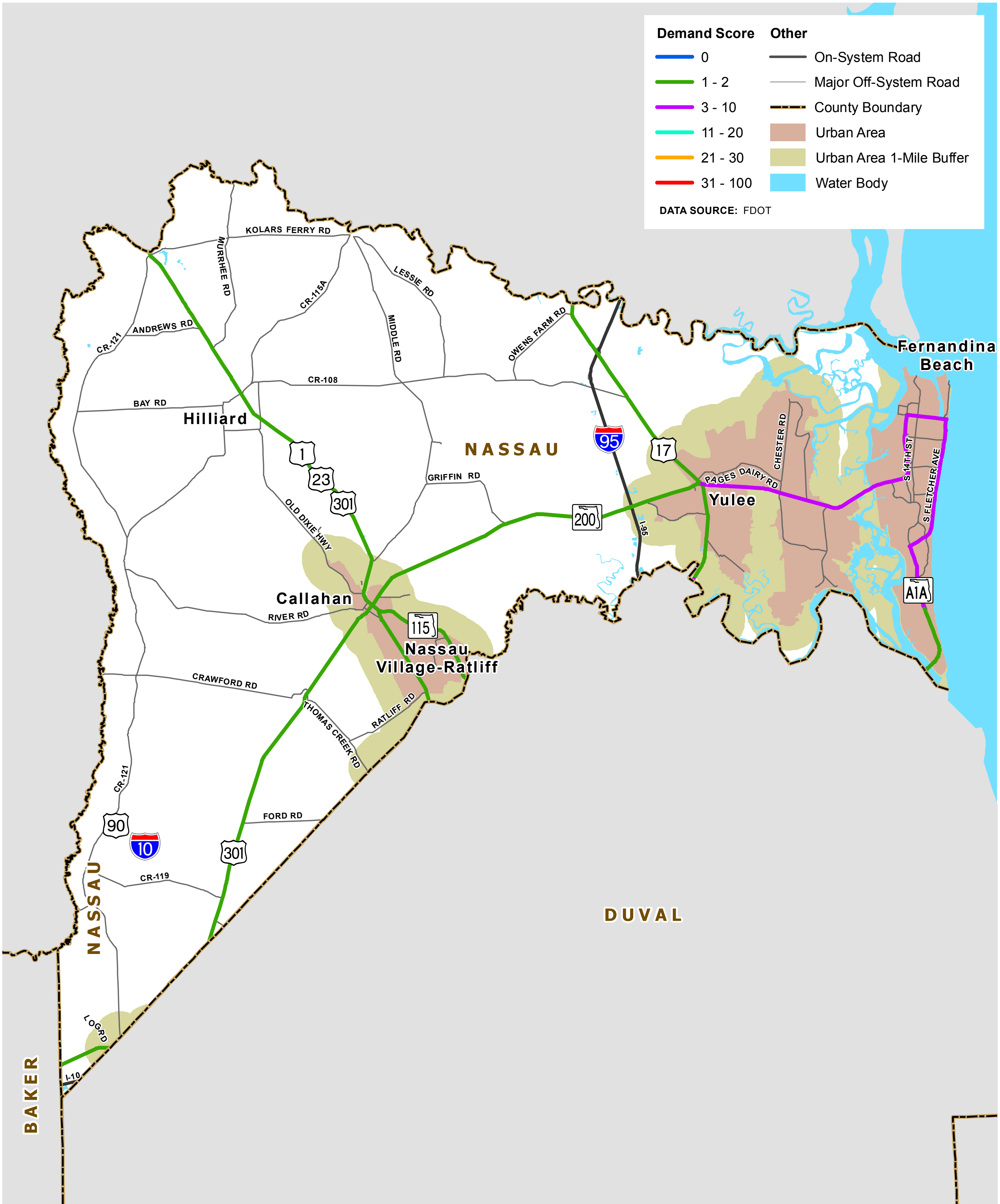



0 3.5 7
Miles

# YEAR 2040 POTENTIAL DEMAND

## MADISON COUNTY

**FIGURE C2-12**



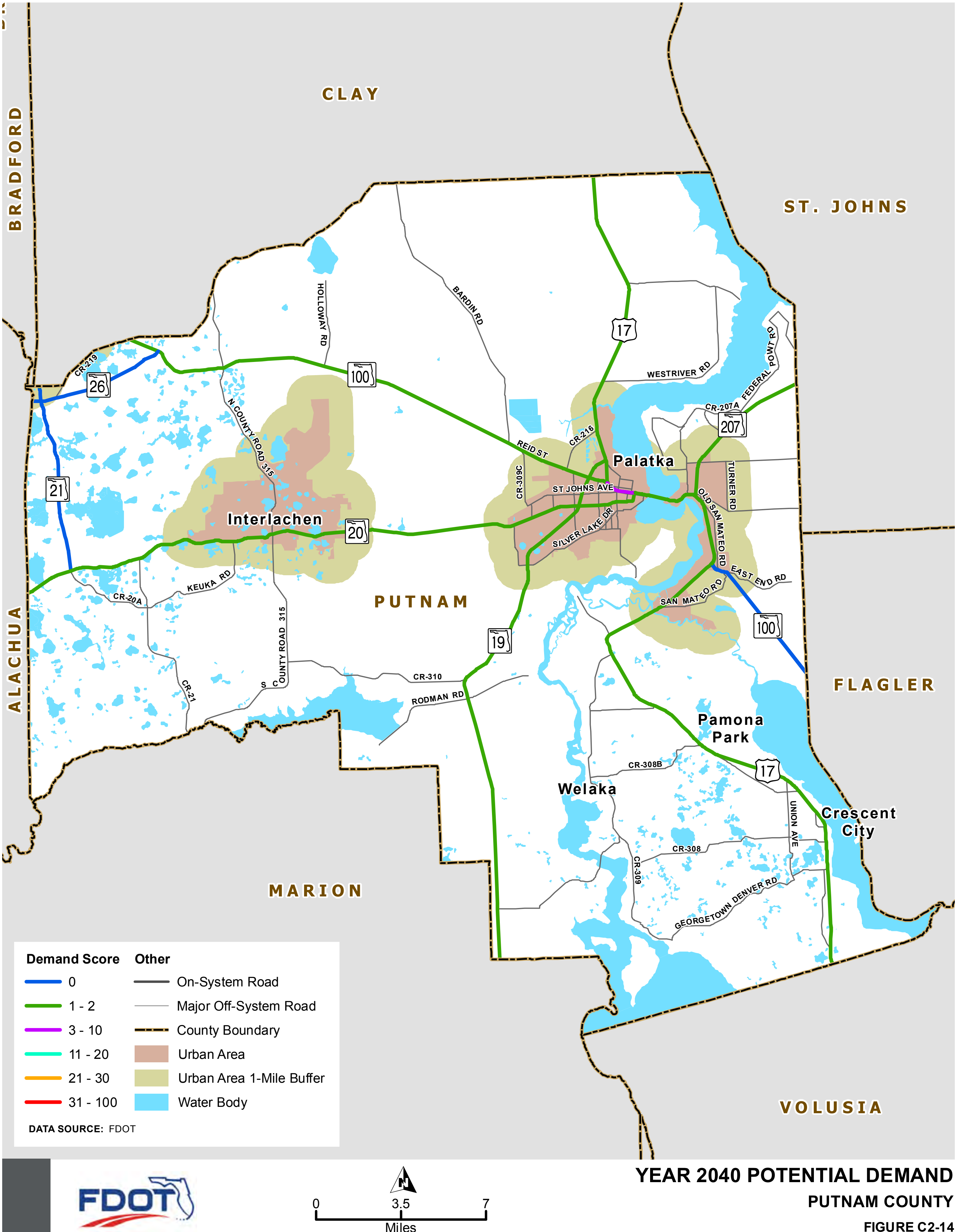

0 3.5 7
Miles

FDOT

# YEAR 2040 POTENTIAL DEMAND

## NASSAU COUNTY

FIGURE C2-13

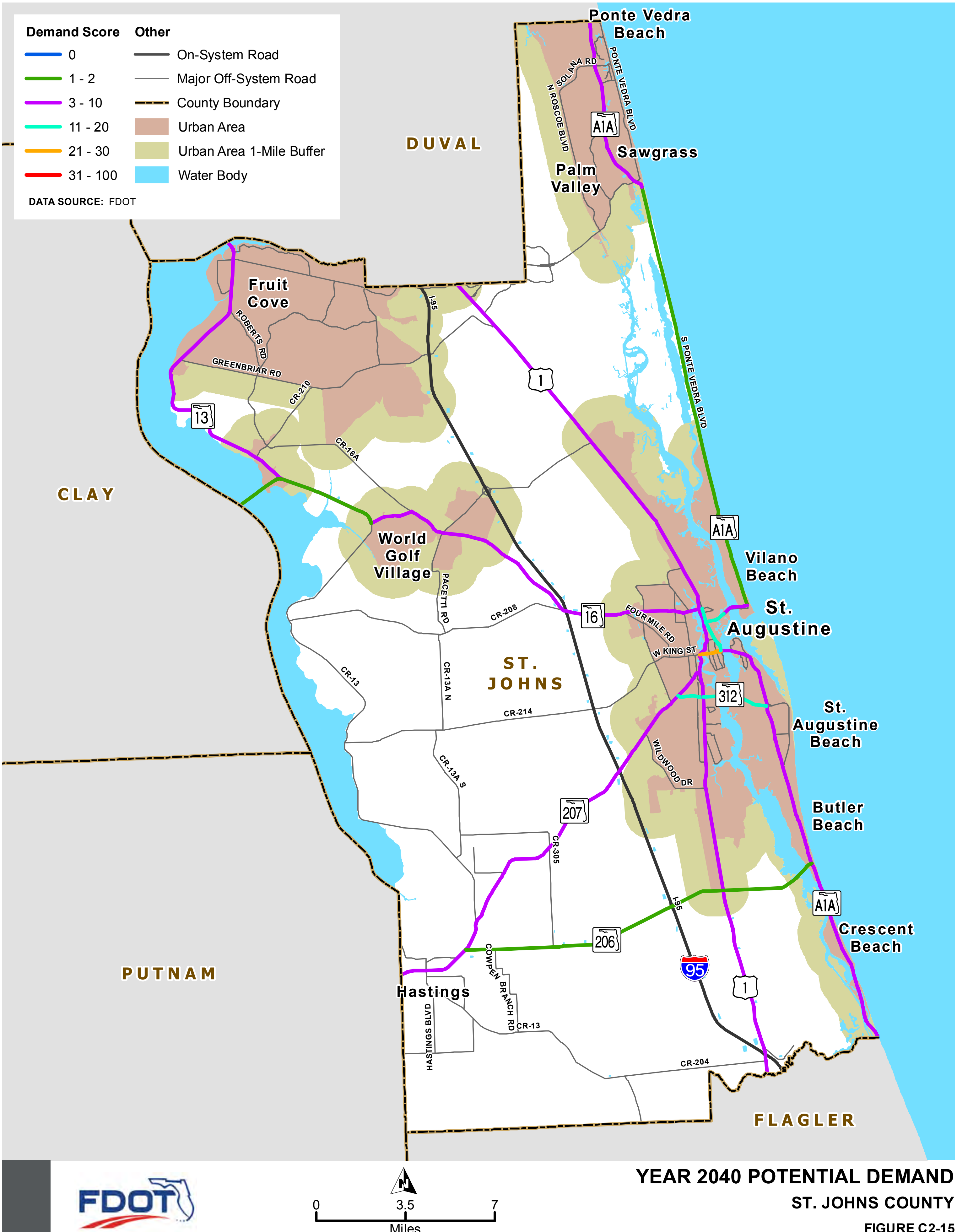



FDOT

# YEAR 2040 POTENTIAL DEMAND

## PUTNAM COUNTY

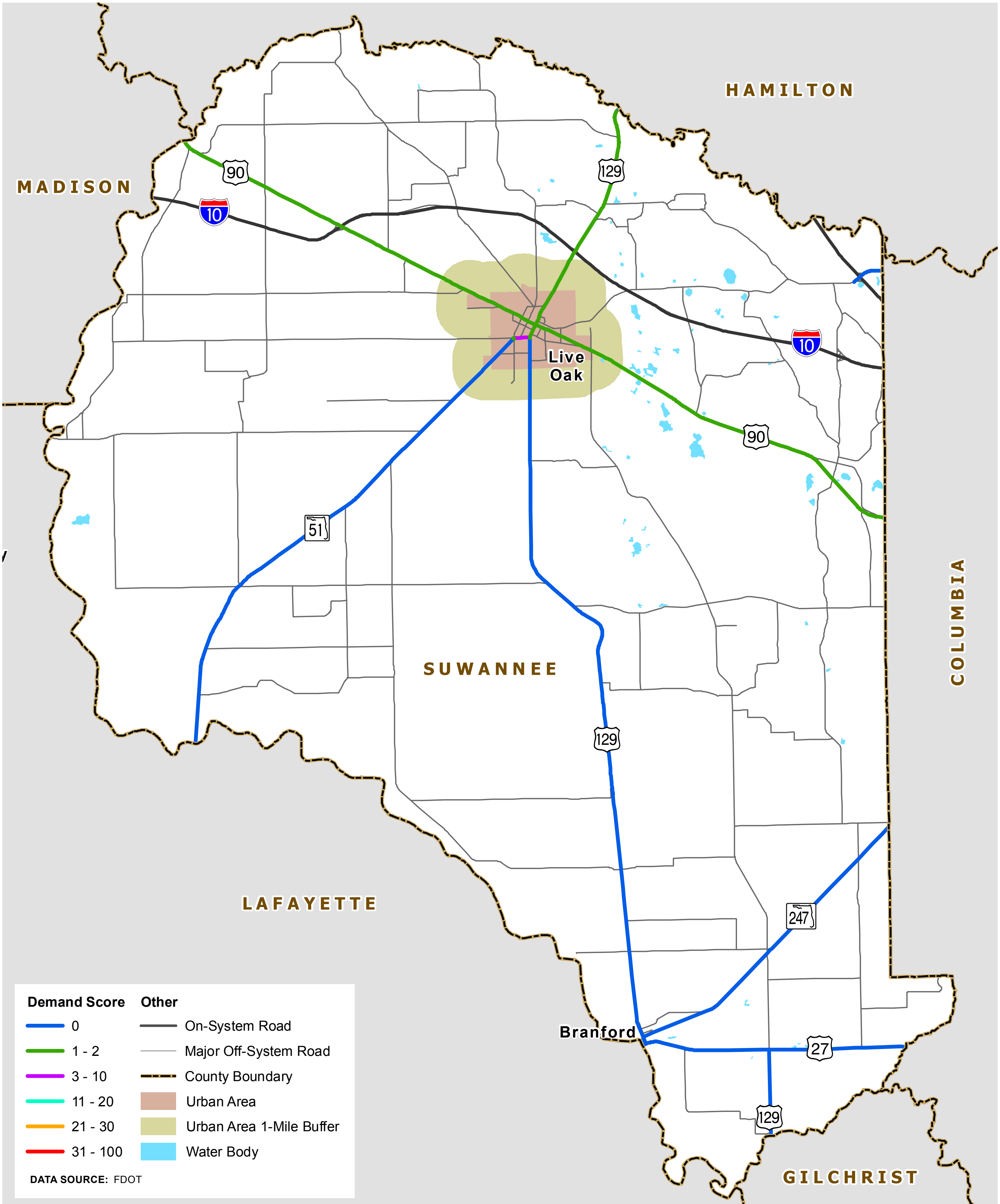
FIGURE C2-14




# YEAR 2040 POTENTIAL DEMAND

## ST. JOHNS COUNTY

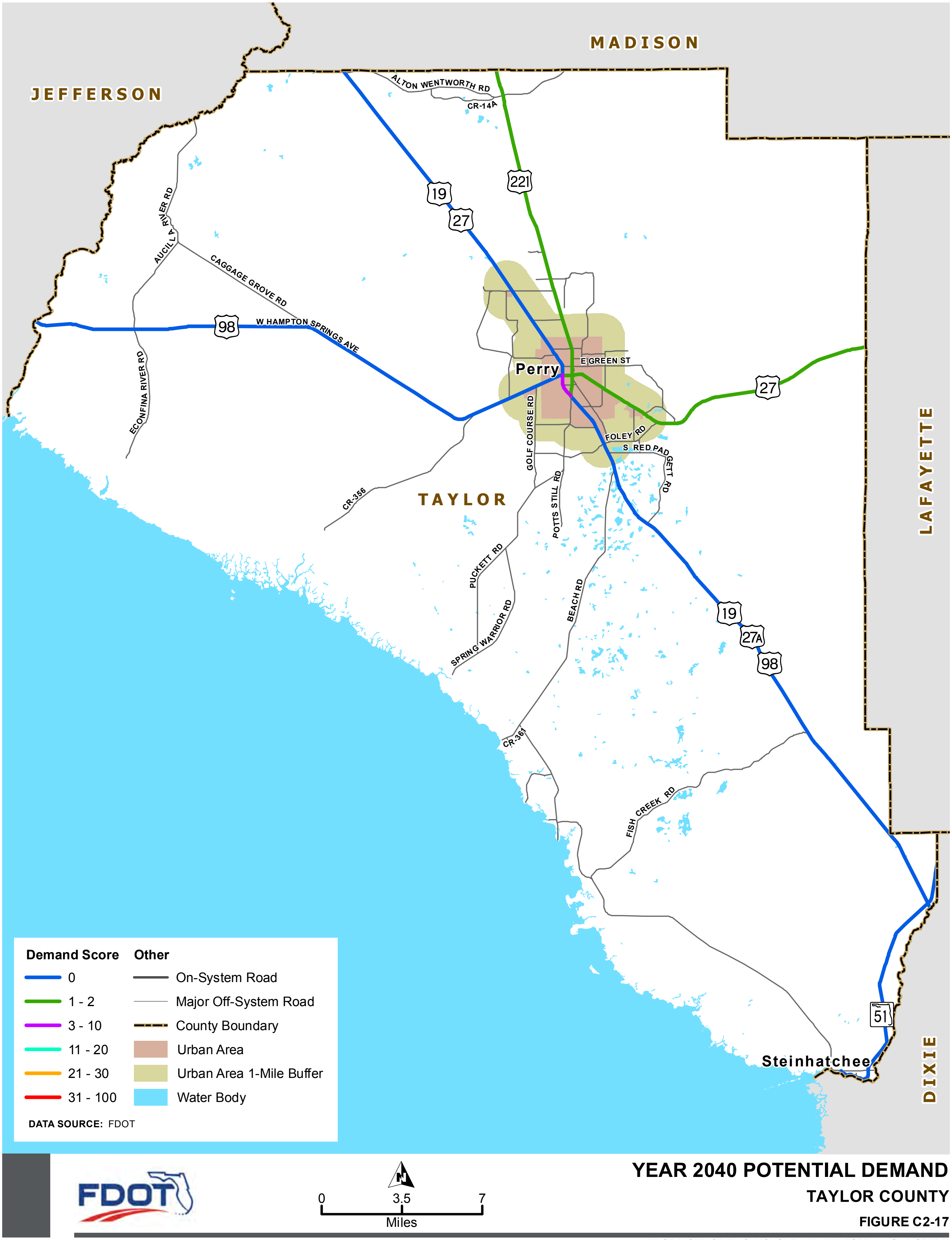
FIGURE C2-15




# YEAR 2040 POTENTIAL DEMAND

## SUWANNEE COUNTY

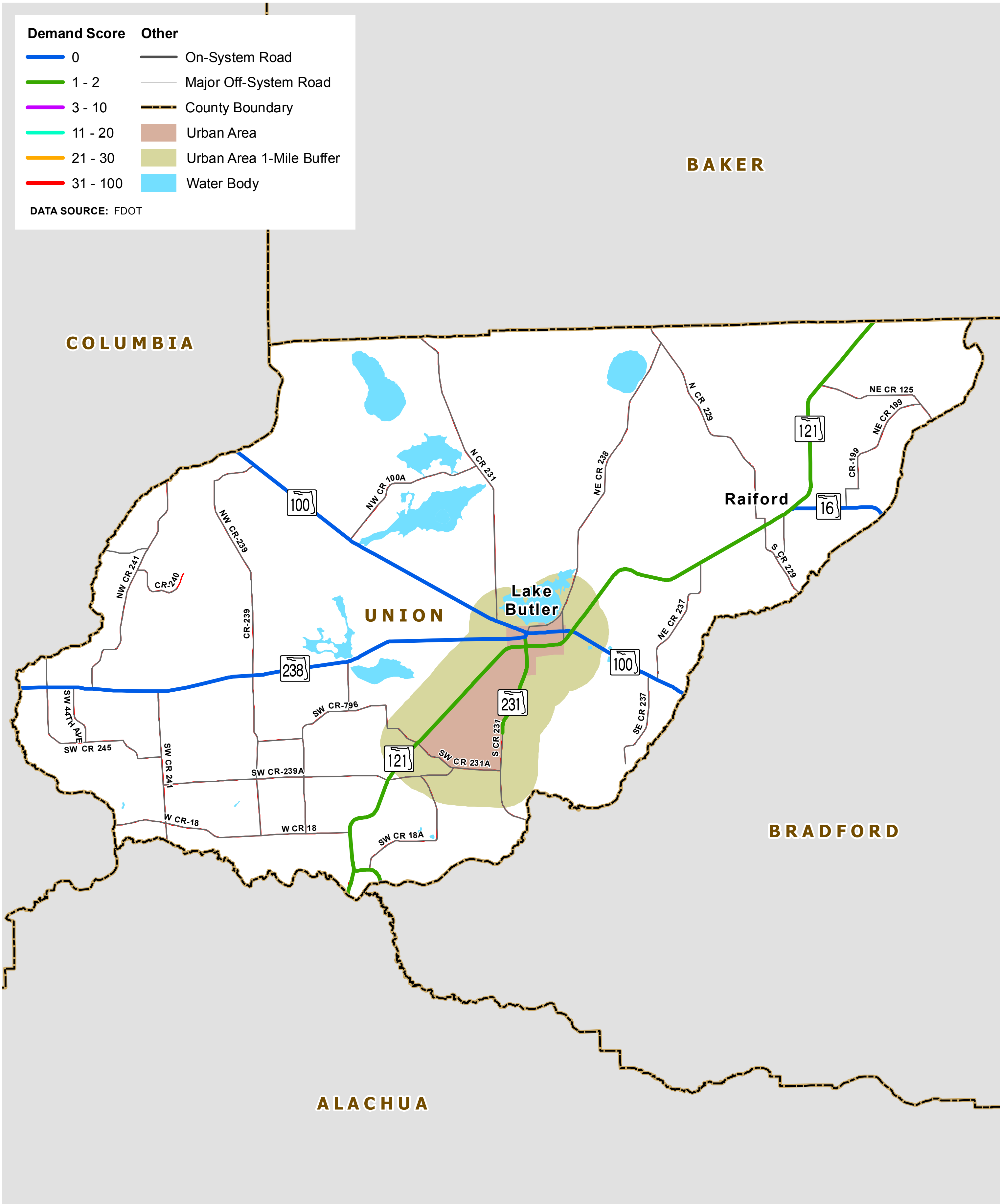
FIGURE C2-16




# YEAR 2040 POTENTIAL DEMAND

## TAYLOR COUNTY

**FIGURE C2-17**




0 2.5 5
Miles

# YEAR 2040 POTENTIAL DEMAND

## UNION COUNTY

FIGURE C2-18

# 06

# Crash and Safety Analysis

# 6.0 Crash and Safety Analysis

The crash and safety analysis reviewed five years (2008 through 2012) of bicycle and pedestrian crash data in FDOT District Two. From these crash data, temporal and spatial trends were identified based on factors such as lighting condition, day of week, and position on roadway, among others. **Figures D1-1** through **D1-18** show bicycle crashes, and **Figures D2-1** through **D2-18** show pedestrian crashes by county. The total number of crashes analyzed by county over the five-year period are listed in **Table 7**.

**Table 4: Total Analyzed Crashes (2008 through 2012)**

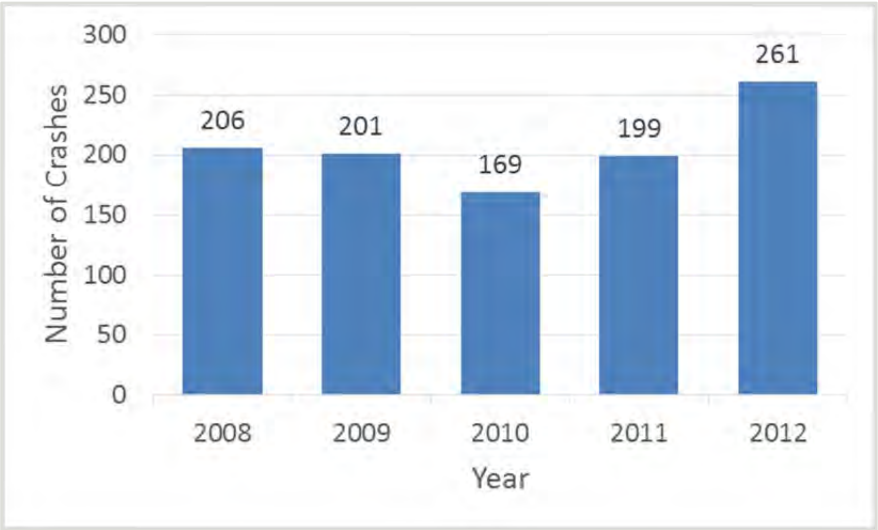
| County | Crashes | |
|---|---|---|
| | Bicycle | Pedestrian |
| Alachua | 318 | 211 |
| Baker | 3 | 6 |
| Bradford | 5 | 15 |
| Clay | 87 | 72 |
| Columbia | 20 | 42 |
| Dixie | 2 | 5 |
| Duval | 474 | 618 |
| Gilchrist | 0 | 3 |
| Hamilton | 1 | 6 |
| Lafayette | 0 | 4 |
| Levy | 6 | 11 |
| Madison | 0 | 6 |
| Nassau | 6 | 22 |
| Putnam | 12 | 42 |
| St. Johns | 89 | 71 |
| Suwannee | 3 | 6 |
| Taylor | 7 | 5 |
| Union | 3 | 1 |
| Total | 1,036 | 1,146 |

## 6.1 Temporal Trends

From January 1, 2008 to December 31, 2012, 1,548 bicycle crashes and 1,566 pedestrian crashes occurred. Of the crashes which occurred within this five year span, 211 involved both bicycle and pedestrian, meaning 211 crashes were classified as both bicycle and pedestrian crashes. Overall, 2,903 different crashes were reviewed for potential analysis. Out of the 1,548 bicycle crashes, 1,036 were ultimately incorporated into the following analysis. Similarly, 1,146 of 1,566 pedestrian crashes were incorporated.[5]

Annually, an average of 207 bicycle crashes occurred, with the highest number of crashes occurring in 2012 and the least in 2010. **Graph 1** shows that the number of bicycle crashes increased from 2010 through 2012.

**Graph 1: Bicycle Crashes by Year**



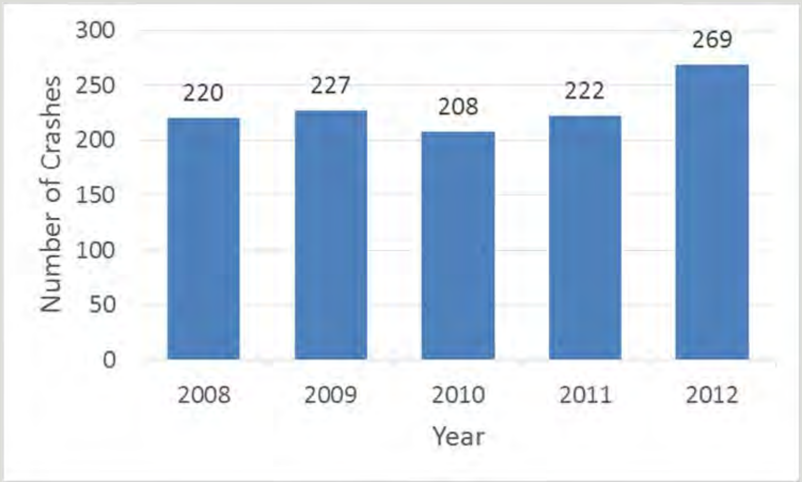

| Year | 2008 | 2009 | 2010 | 2011 | 2012 | Total | Annual Average |
|---|---|---|---|---|---|---|---|
| Number of Bicycle Crashes | 206 | 201 | 169 | 199 | 261 | 1036 | 207 |

---

[5] Due to inconsistencies in crash reporting, a significant number of bicycle and pedestrian crashes were eliminated from analysis. The identified inconsistencies are a result of conflicting indications described by the raw crash data files. The researchers determined that to be considered for analysis, two data fields from the crash data files must **not** be conflicting. The data field indicating "count of bicyclists" must be consistent with the field indicating "first/most harmful event." In the instance that the "count of bicyclists" field contained an integer of 1 or greater while the "first/most harmful event" did not indicate collision with bicycle, this crash was eliminated from analysis. Crashes which indicated a "count of bicyclists" of zero and a "first/most harmful event" of collision with bicycle were also eliminated from analysis. Therefore, only those crashes which indicated a "count of bicyclists" of one or more **and** a "first/most harmful event" of collision with bicycle were analyzed. This method of identifying and removing inconsistent data was also applied to pedestrian crashes.

There were an average of 229 pedestrian crashes annually between 2008 and 2012. The highest number of crashes occurred in 2012 and the least in 2010. As shown in **Graph 2**, with the exception of 2010 and 2012, the number of crashes remained relatively steady. Annually, there was an average of 22 more pedestrian crashes than bicycle crashes.

Graph 2: Pedestrian Crashes by Year

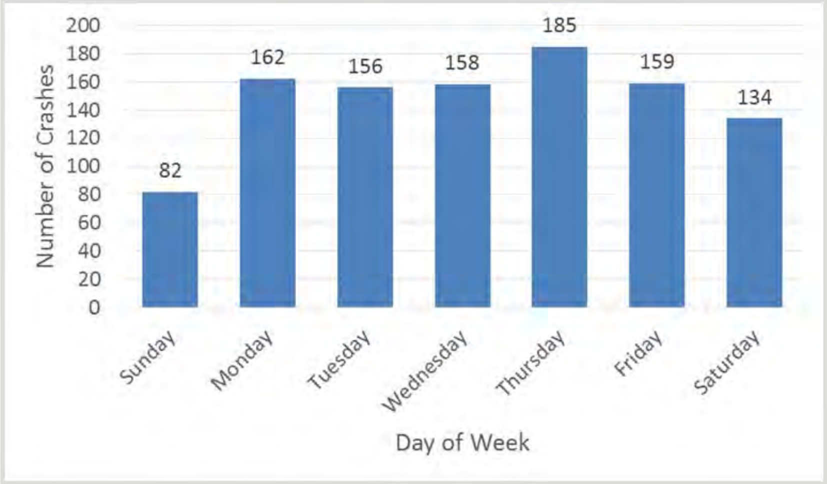



| Year | 2008 | 2009 | 2010 | 2011 | 2012 | Total | Annual Average |
|---|---|---|---|---|---|---|---|
| Number of Bicycle Crashes | 220 | 227 | 208 | 222 | 269 | 1146 | 229 |

### 6.1.1 Day of Week

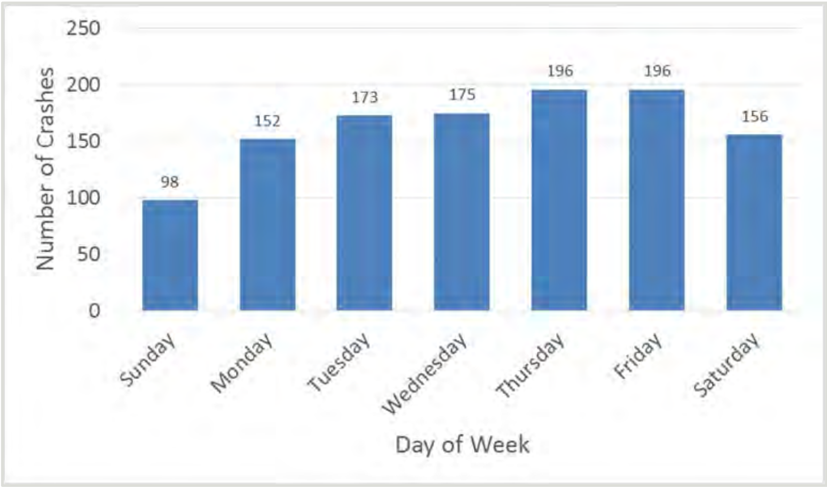
**Graph 3** shows the number of bicycle crashes that occurred by day of week. Thursday had the most bicycle crashes, with all other weekdays having similar totals and Sunday having the least. The reduction in crashes on Sunday is likely due to a reduction in automobile traffic volume.

Graph 3: Bicycle Crashes by Day of Week



**Graph 4** shows the number of pedestrian crashes that occurred by day of week. The highest amounts of crashes occurred on Thursday and Friday, with the least occurring on Sunday. Again, the reduction in crashes on Sunday is likely due to reduced automobile traffic volume.

**Graph 4: Pedestrian Crashes by Day of Week**




## 6.1.2 Month

**Graph 5** shows that July and August each had the most bicycle crashes out of all the months, followed closely by October, while February had the least number of crashes.

**Graph 5: Bicycle Crashes by Month**

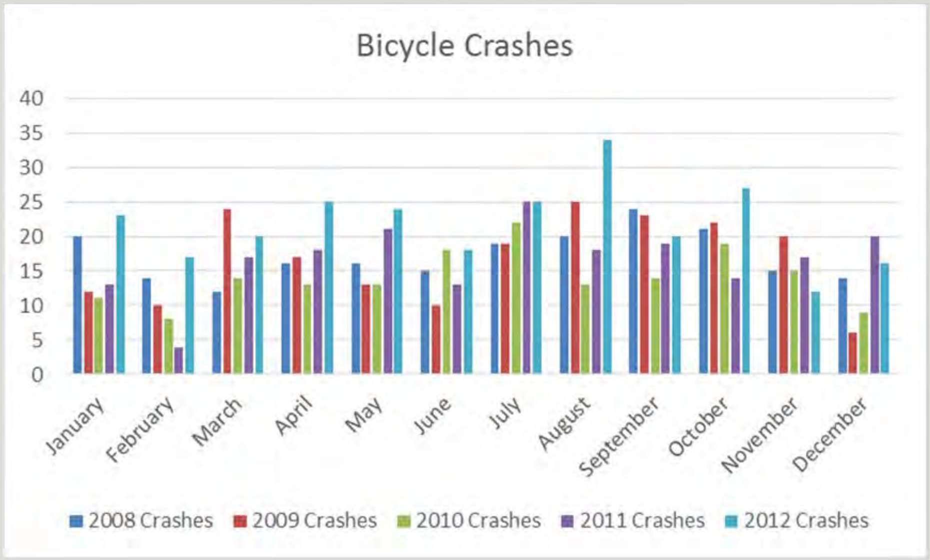
As seen in **Graph 6**, December experienced the most pedestrian crashes, followed by October, while June had the least number of crashes.

**Graph 6: Pedestrian Crashes by Month**

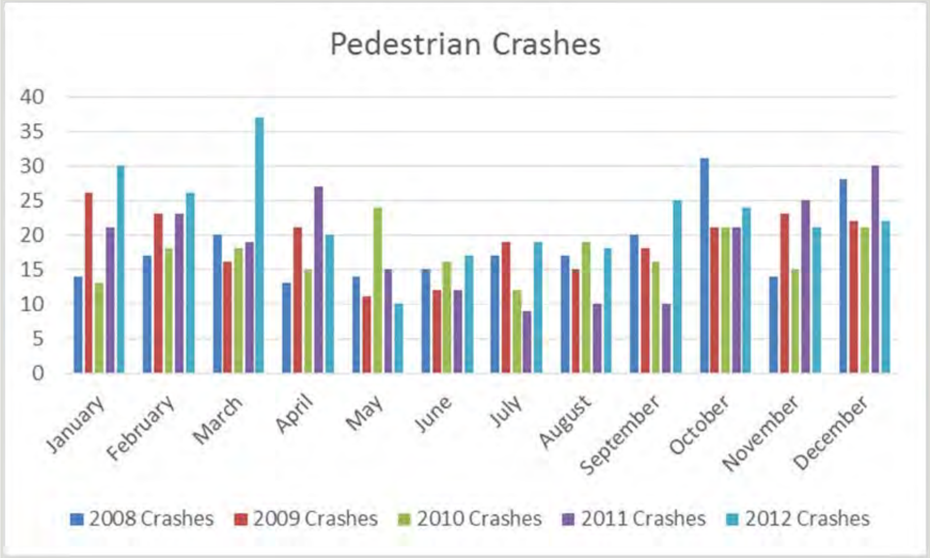

### 6.1.3 Month and Year

The crash data was analyzed by month and year for informational purposes. Most bicycle crashes by month and year occurred in August 2012, as seen in **Graph 7**, with over 30 crashes. **Graph 8** shows that most pedestrian crashes by month and year occurred in March 2012, with over 35 crashes.

**Graph 7: Bicycle Crashes by Month and Year**



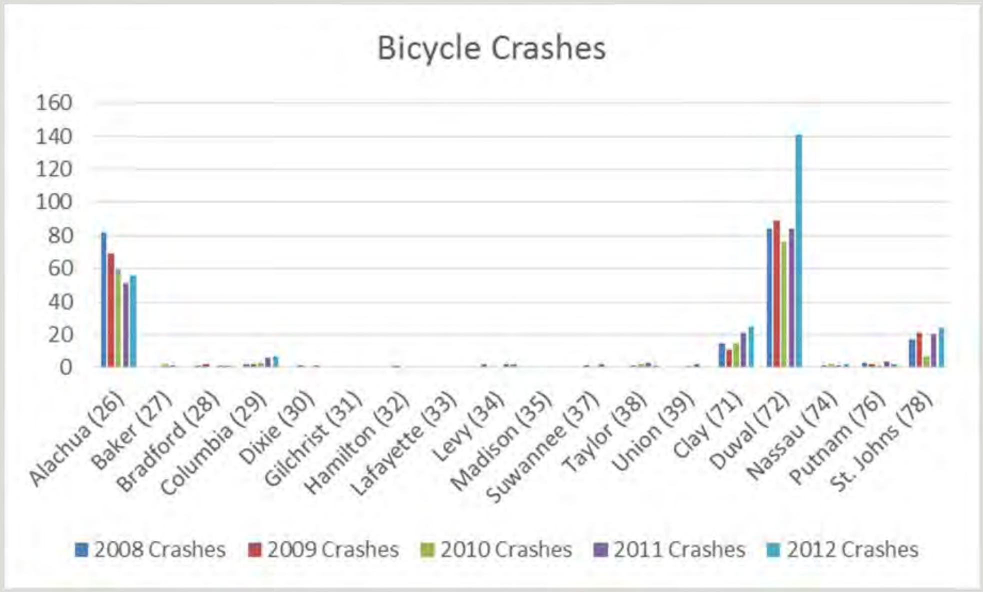
**Graph 8: Pedestrian Crashes by Month and Year**



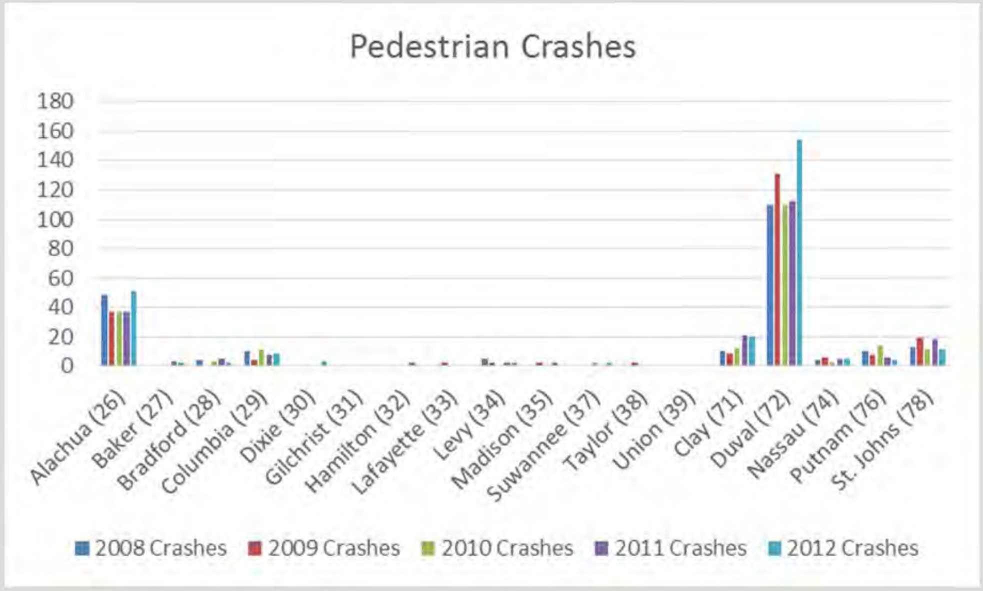

### 6.1.4 County and Year

The crash data was analyzed by county and year for informational purposes. **Graphs 9** and **10** show that most bicycle and pedestrian crashes by county and year occurred in Duval County in 2012. Not surprisingly, Alachua and Duval Counties are the most populous counties in the District and have the most bicycle and pedestrian crashes due to their urbanized areas (i.e., Jacksonville and Gainesville).

**Graph 9: Bicycle Crashes by County and Year**



Graph 10: Pedestrian Crashes by County and Year




## 6.2 Time of Day

### 6.2.1 Overall

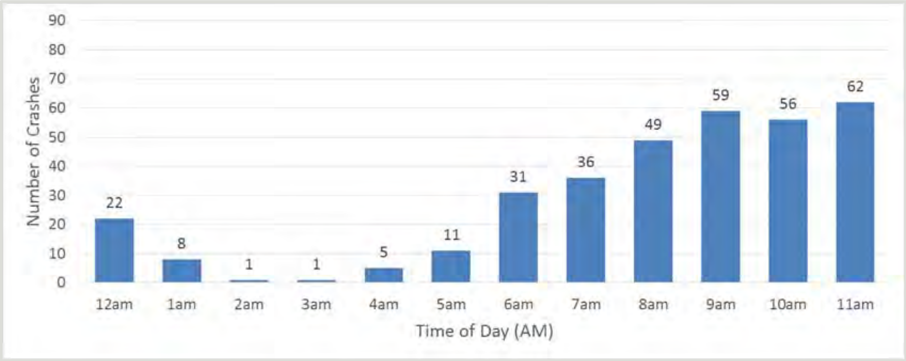
**Graph 11** shows that during the morning hours, most bicycle crashes occurred between 9:00 AM and 11:00 AM. As expected, most bicycle crashes occurred during the PM peak hours of 4:00 PM and 5:00 PM, as shown in **Graph 12**.

Generally, the number of bicycle crashes correlated with the levels of expected motor vehicle and bicycle traffic volume. A significant drop occurred at 7:00 PM into the later evening hours. Morning crashes were rare before 6:00 AM, although 22 crashes occurred during the hour of 12:00 AM.

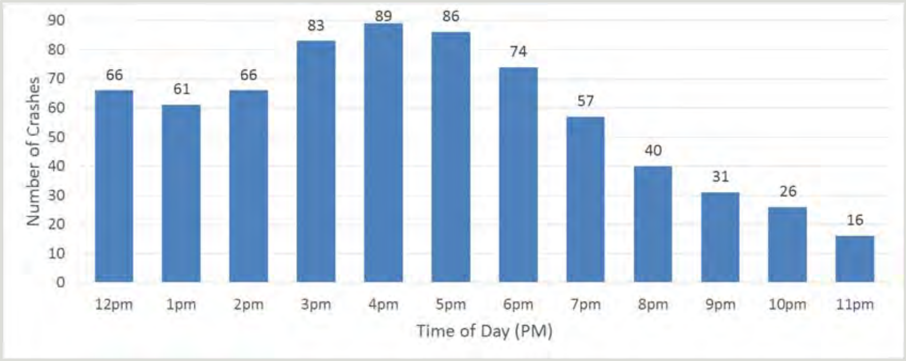
**Graph 13** shows pedestrian crashes for the morning hours. Pedestrian crashes were almost twice as common during the afternoon than in the morning. **Graph 14** shows that most crashes occurred between 6:00 PM and 7:00 PM. The 97 crashes that occurred between 6:00 PM and 7:00 PM are more than two standard deviations above the average crashes per hour.

While there were fewer pedestrian crashes in the late evening and early morning, the relative decrease was not as significant as the decrease observed for bicycle crashes. Other factors, such as lighting, may have caused a disproportionately high percentage of crashes during times of low pedestrian traffic volume.

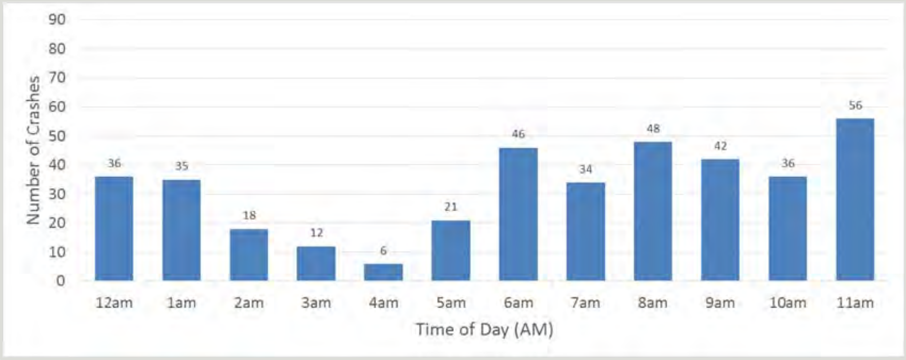
## Graph 11: AM Bicycle Crashes



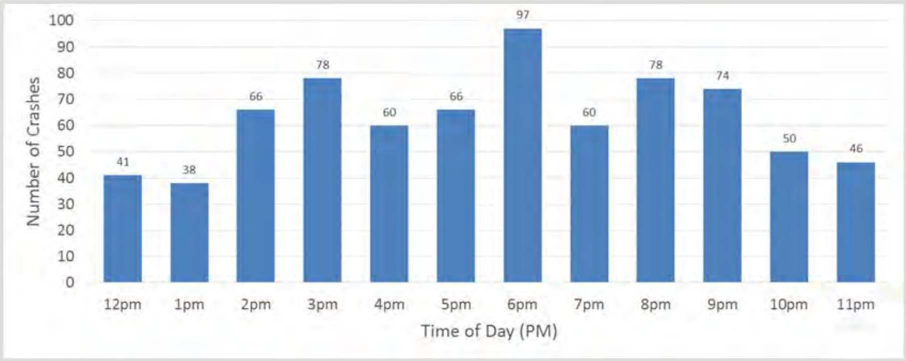

## Graph 12: PM Bicycle Crashes




## Graph 13: AM Pedestrian Crashes



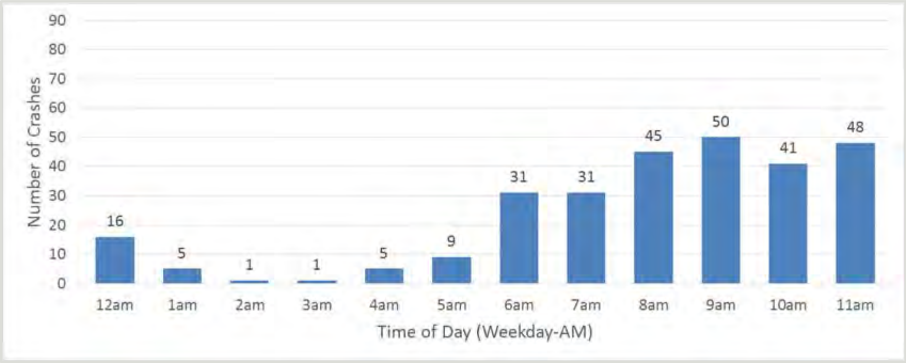
**Graph 14: PM Pedestrian Crashes**



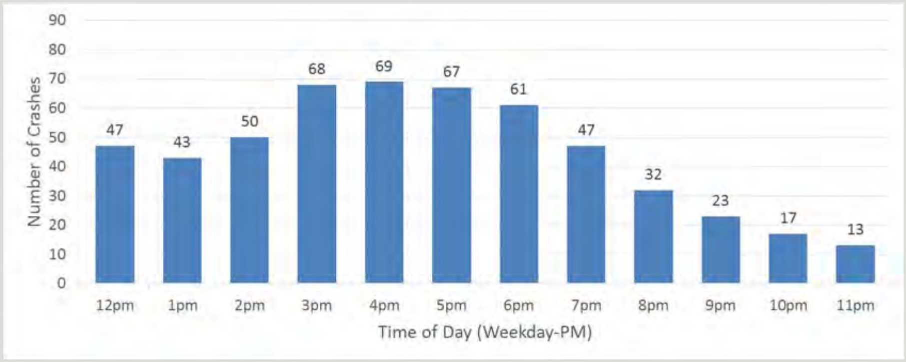

## 6.2.2 Bicycle

Bicycle crashes for weekdays and weekends trended as expected. Weekday crashes, shown in **Graphs 15** and **16**, generally followed a similar pattern compared to overall crashes. A late afternoon spike could be seen corresponding to the PM peak motor vehicle volume, followed by a decline into the evening. The morning weekday bicycle crash patterns generally mirrored the overall bicycle crash trends.

**Graph 15: AM Weekday Bicycle Crashes**

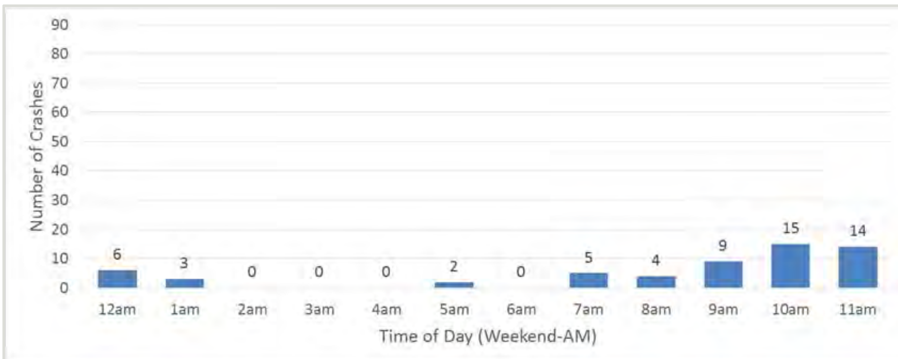



**Graph 16: PM Weekday Bicycle Crashes**

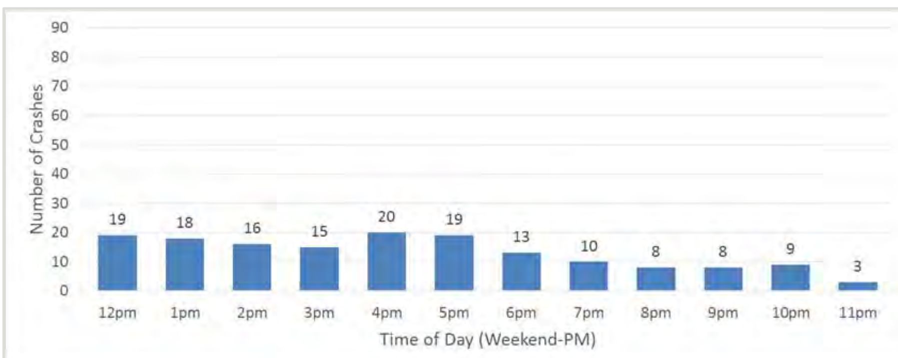


Weekend crashes for bicycles also exhibited normal trends, as seen in **Graphs 17** and **18**. Crashes remained consistent from 10:00 AM through 6:00 PM. The AM and PM peak crashes were less apparent, if existent at all. A noticeable decrease in crashes was seen at 11:00 PM, with an apparent decline into the early morning hours.

**Graph 17: AM Weekend Bicycle Crashes**




**Graph 18: PM Weekend Bicycle Crashes**




### 6.2.3 Pedestrian

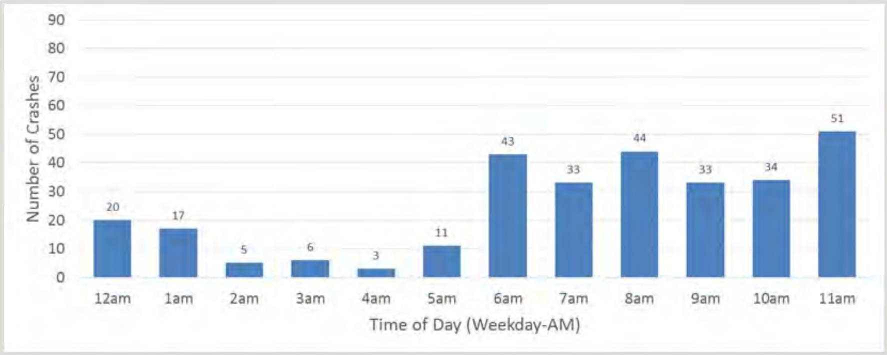
A refined look at pedestrian crashes revealed some interesting trends.

Weekday pedestrian crashes exhibited very similar characteristics to the overall pedestrian crashes for both AM and PM hours, as seen in **Graphs 19** and **20**. The same morning and afternoon peaks were seen in weekday pedestrian crashes as in overall pedestrian crashes.

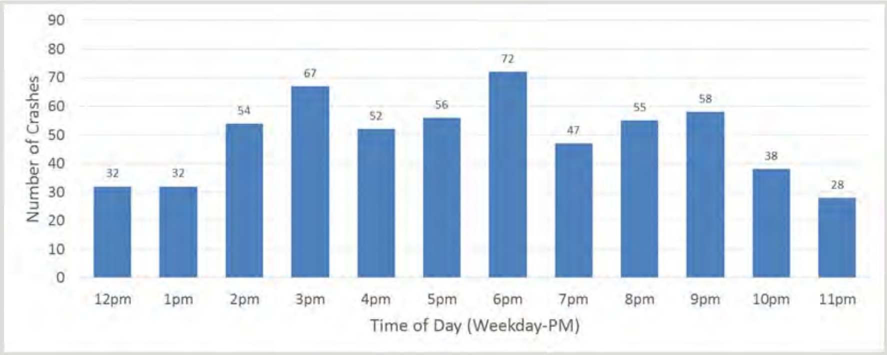
**Graphs 21** and **22** show that weekend pedestrian crash trends deviated from weekday pedestrian crash trends significantly. Generally, crashes remained steady from noon through 5:00 PM. Most weekend pedestrian crashes occurred during the 6:00 PM hour.

Between 11:00 PM and 3:00 AM, 71 weekend pedestrian crashes occurred. The same time period saw 76 weekday pedestrian crashes. This suggests that on the weekend there was a relative increase in pedestrian traffic in the late evening and early morning hours. This increase in pedestrian traffic coupled with possible poor lighting conditions likely explains the high number of crashes during this four-hour period.

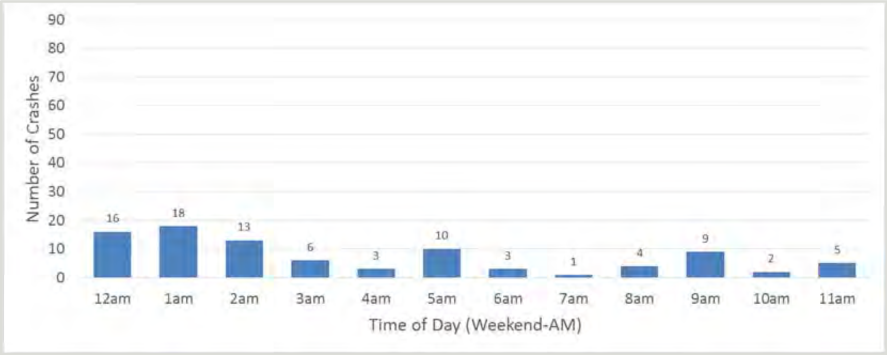
**Graph 19: AM Weekday Pedestrian Crashes**



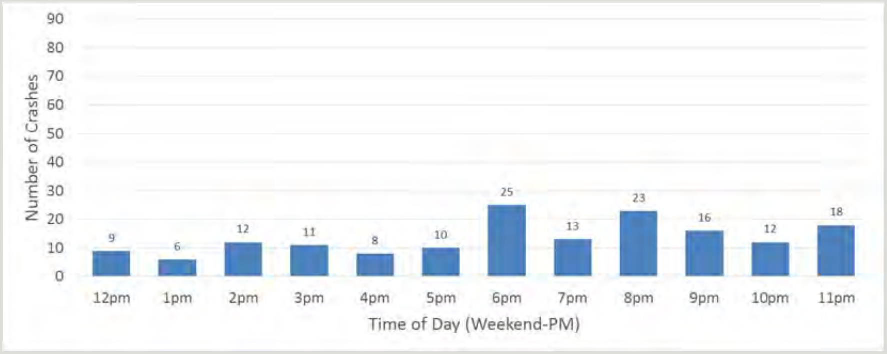

**Graph 20: PM Weekday Pedestrian Crashes**




**Graph 21: AM Weekend Pedestrian Crashes**



Graph 22: PM Weekend Pedestrian Crashes

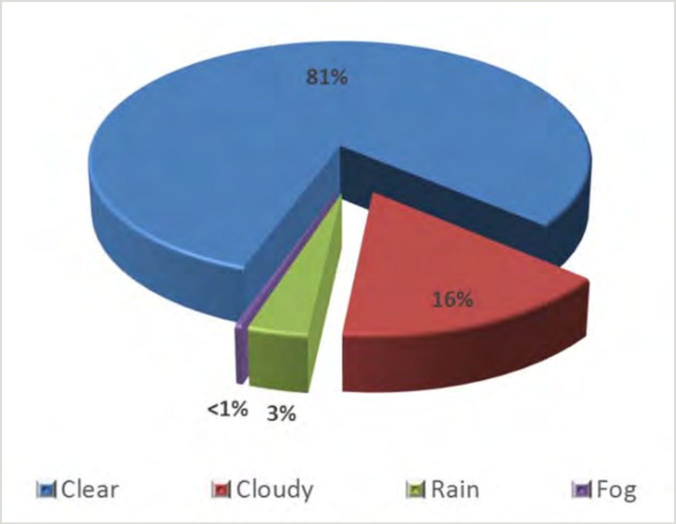



## 6.3 Conditions

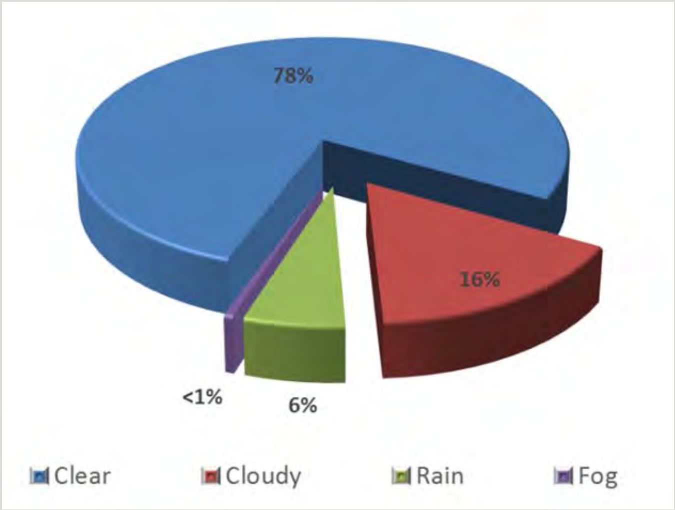
### 6.3.1 Weather

Both bicycle crashes and pedestrian crashes had about the same distribution of weather conditions. Most crashes (81 percent for bicycle and 78 percent for pedestrian) occurred under clear conditions, with cloudy conditions noted in 16 percent for both bicycle and pedestrian crashes, as shown in **Graphs 23** and **24**. The low number of crashes during adverse weather conditions is likely tied to a reduction in bicycle and pedestrian traffic volume; however, pedestrian crashes in the rain were 3 percent higher than bicycle crashes in the rain. This is likely due to pedestrian trips that must be made regardless of the inclement weather, such as walking to the bus stop or to and from work.

Graph 23: Bicycle Crashes by Weather Condition



Graph 24: Pedestrian Crashes by Weather Condition

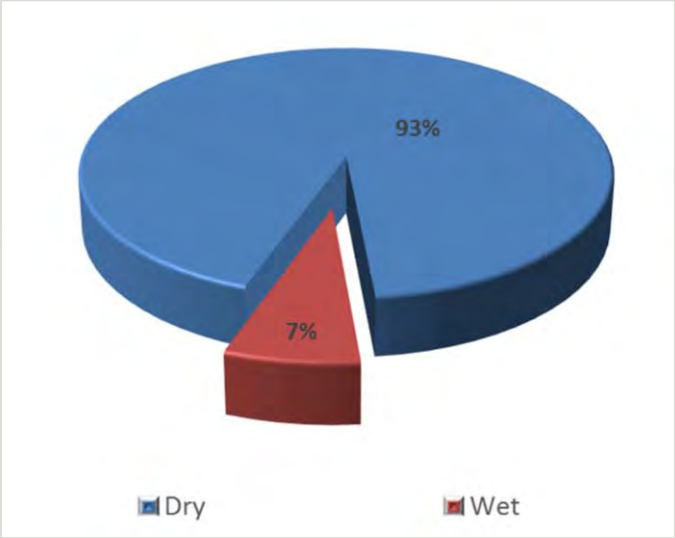



### 6.3.2 Road Surface

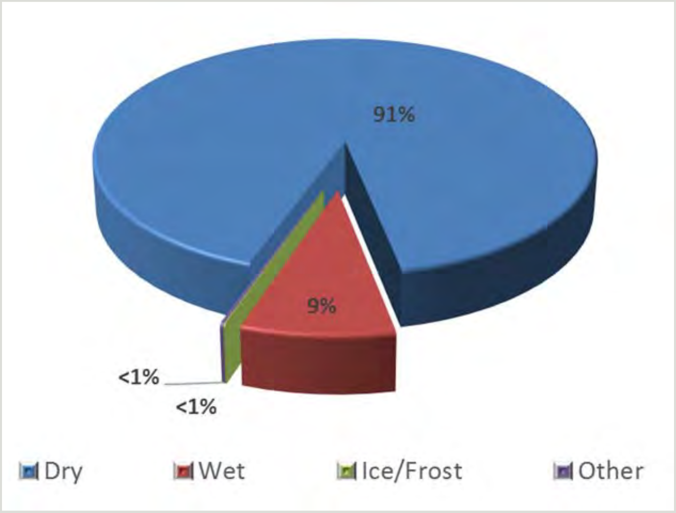
Road surface condition had seemingly minimal impact on most bicycle and pedestrian crashes, as most crashes involved a dry road surface.

Since bicycle and pedestrian use is low during adverse weather conditions, a wet road surface was reported in few bicycle and pedestrian crashes, as shown in **Graphs 25** and **26**, respectively. Icy or other conditions were reported in only three pedestrian crashes.

Graph 25: Bicycle Crashes by Road Surface Condition



**Graph 26: Pedestrian Crashes by Road Surface Condition**

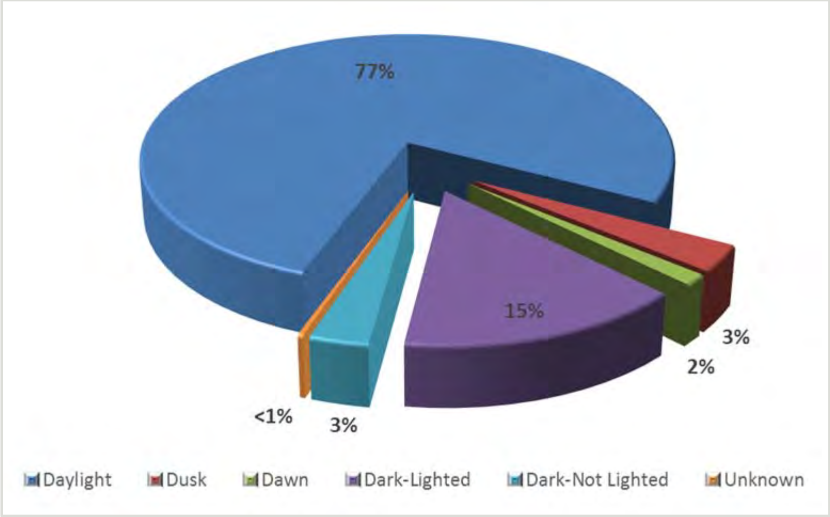



## 6.3.3 Light

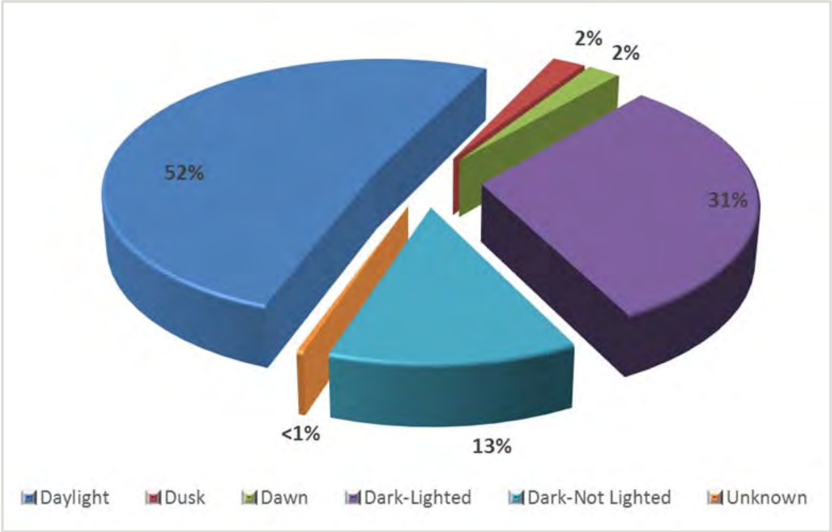
Of the 1,036 first harmful event bicycle crashes, 799 (77 percent) occurred during daylight conditions, as shown in **Graph 27**. More crashes occurred at dusk (34) than at dawn (14). The percentage of crashes occurring during daylight conditions correlated strongly with the time of day. As shown in **Graph 12**, there was a sharp decline in bicycle crashes starting at 7:00 PM, which generally continued through early morning until 5:00 AM.

**Graph 28** shows that almost half of the 1,146 first harmful event pedestrian crashes occurred during daylight conditions. Dusk and dawn lighting conditions had the same number of crashes (25). Both dark, street light, and no street light, conditions saw a significant proportion of crashes.

**Graph 27: Bicycle Crashes by Light Condition**



Graph 28: Pedestrian Crashes by Light Condition



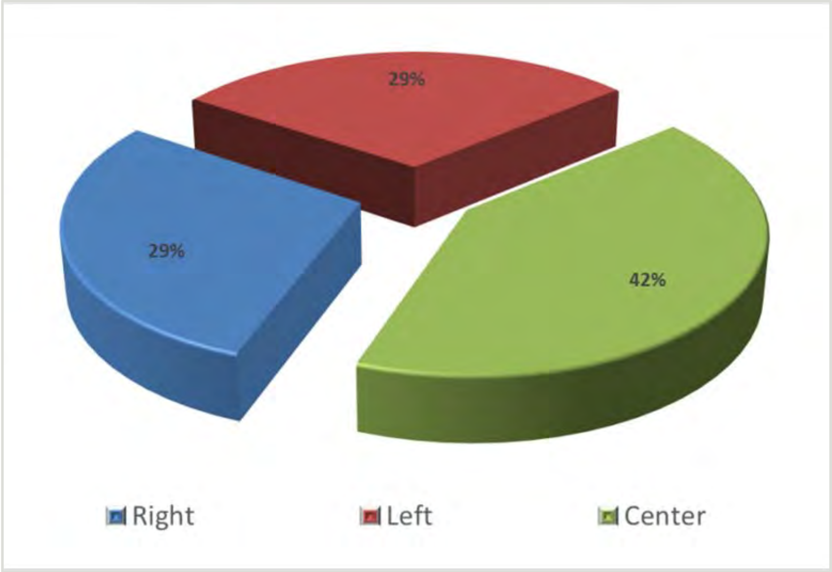

### 6.3.4 Side of Road

Most bicycle crashes occurred in the center of the road, with right- and left-side crashes being almost equally distributed, as shown in **Graph 29**.

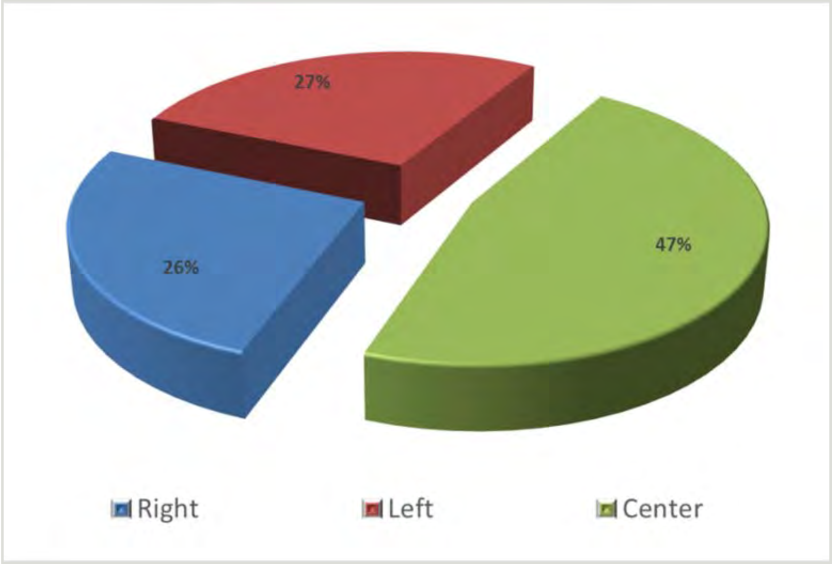
**Graph 30** shows that almost half of the pedestrian crashes occurred in the center of the road, with left- and right-side crashes differing by only 1 percent.

When analyzing crashes by side of road, firm conclusions about crash trends could not be drawn without examining other relevant data. In this case, distributions for both bicycle crashes and pedestrian crashes were not atypical.

**Graph 29: Bicycle Crashes by Side of Road**




**Graph 30: Pedestrian Crashes by Side of Road**



## 6.4 Contributing Causes

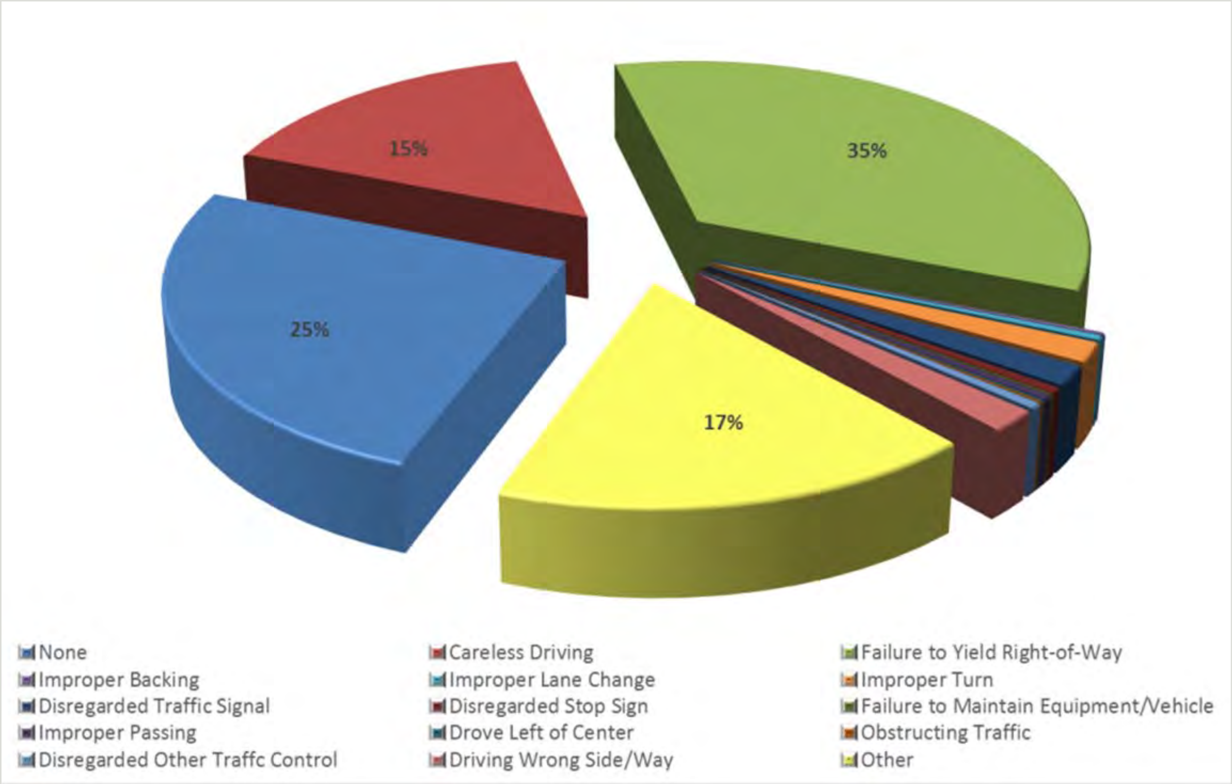
### 6.4.1 Bicycle

**Graph 31** breaks out contributing causes for bicycle crashes, with the most common contributing cause being "Failure to Yield Right-of-Way" (on the part of either the bicyclist or the motorist). "None" was indicated for 25 percent of the crashes, 15 percent were for "Careless Driving" (on the part of the motorist), and "Other" was at 17 percent. Eleven other contributing causes comprised the last 8 percent of the bicycle crashes.

As noted in **Section 6.3.4**, 42 percent of bicycle crashes occurred in the middle of the roadway. This coincided with a similar proportion of failure to yield as a contributing cause. A common bicycle crash consisted of the bicyclist crossing a side street and being hit by a driver turning but ignoring or failing to check for bicyclists in the crosswalk.

Not all bicycle crashes were the fault of the driver; 25 percent of crashes had no contributing causes. This means that either all parties involved were equally at fault or it could not be determined who was at fault.

**Graph 31: Bicycle Crashes by Contributing Causes**



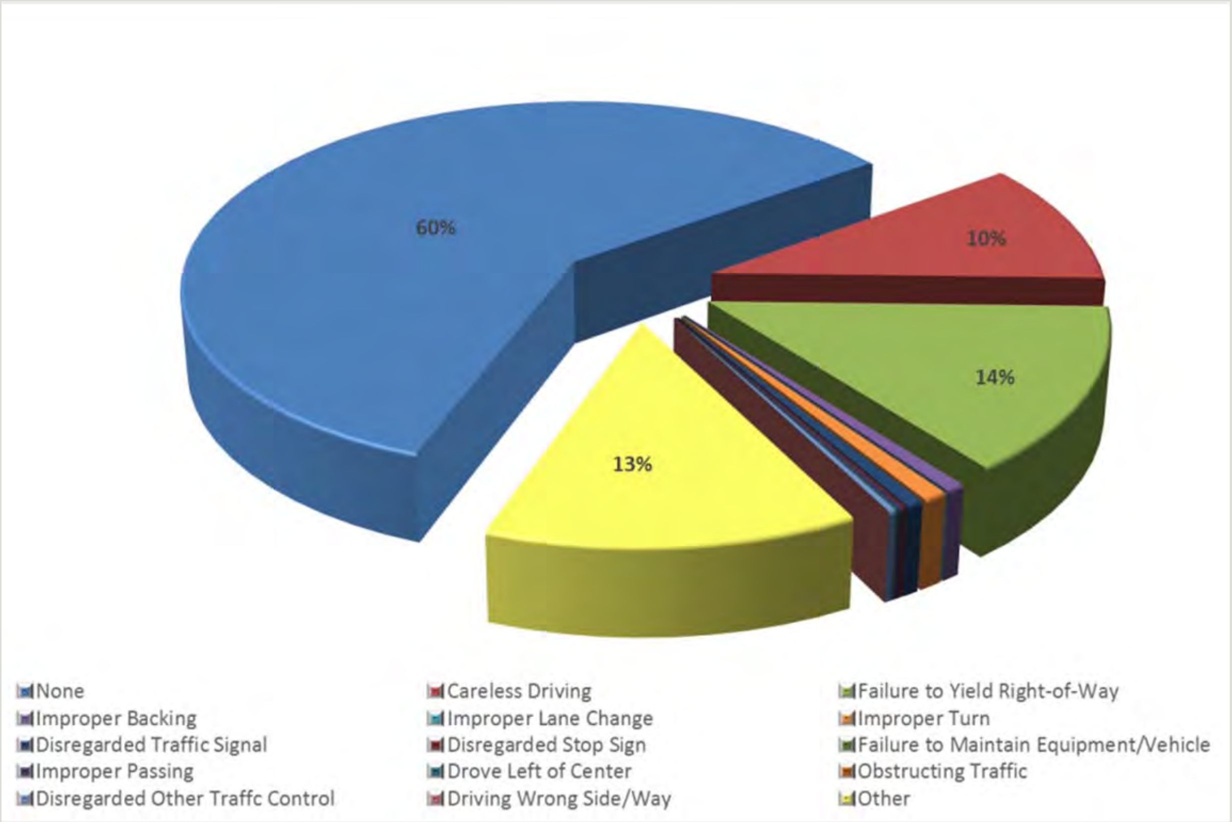

***Note***: Some crashes may have had multiple contributing causes. In these cases, only the first contributing cause according to the accident report was considered.

### 6.4.2 Pedestrian

**Graph 32** shows 60 percent of pedestrian crashes were coded “None” for a contributing cause. “Other,” “Failure to Yield Right-of-Way” (on the part of either the pedestrian or the motorist), and “Careless Driving” (on the part of the motorist) comprised 13 percent, 14 percent, and 10 percent of the pedestrian crashes, respectively. Thirteen other contributing causes comprised the remaining 3 percent of pedestrian crashes.

Although contributing causes are subject to a police officer’s ability to corroborate witness statements and recreate the crash scene as it happened, the lack of a contributing cause suggests that all parties involved were either not at fault or shared it equally. Furthermore, no contributing cause suggests that other environmental factors, such as lighting, may have influenced the crashes.

**Graph 32: Pedestrian Crashes by Contributing Causes**




***Note:*** Some crashes may have had multiple contributing causes. In these cases, only the first contributing cause according to the accident report was considered.

## 6.5 Crash Clusters

Safety for all users is one of the FDOT's fundamental goals. The FDOT Safety Office created crash clusters from individual bicycle and pedestrian crashes using crash data from 2007 to 2011. These clusters revealed corridors that have concentrations of bicycle and pedestrian crashes. The analysis indicates that these corridors should be further investigated for safety concerns or improvements. The gap prioritization methodology only used the crash data presented in Sections 6.1 through 6.4. This crash cluster analysis is provided as information from FDOT Safety Office for bicycle and pedestrian crashes.

The bicycle and pedestrian crash clusters were generated using the same methodology. Any crashes within 50 feet of each other were pulled to a common location. These were crash groups. The cash groups were then collapsed into a single point called a crash cluster, and the individual crashes were summed up as an attribute of the new point. The crash clusters were then buffered by 300 feet and dissolved to create one contiguous area.

Bicycle crashes were more likely to occur in the urbanized areas. **Table 8** shows the five largest bicycle crash clusters in the District. The largest crash cluster occurred in Gainesville (Alachua County) on NW 13$^{th}$ Street (U.S. 441/S.R. 25) from NW 16$^{th}$ Avenue to just south of West University Avenue (S.R. 26). There were 45 crashes, 40 injuries, and 2 fatalities along this 1.26-mile corridor. **Figure D3-1** shows the crash cluster locations that occurred in Alachua County. The second largest cluster occurred in Jacksonville Beach (Duval County) on 3$^{rd}$ Street (S.R. A1A) north and south of Beach Boulevard (S.R. 212). There were 27 crashes, 24 injuries, and 1 fatality along this 0.63-mile corridor. **Figure D3-7** shows the crash cluster locations that occurred in Duval County.

The crash clusters are aggregated buffered areas and included nearby roads. For further investigation of a crash cluster, the individual crash reports should be collected and analyzed.

NW 13$^{th}$ Street from West University Avenue to SW Archer Road in Gainesville and 3$^{rd}$ Street south of Beach Boulevard in Jacksonville Beach are at an LOS F for vehicular traffic according to the FDOT's *Florida State Highway System Level of Service Report 2013* dated August 2014. Improving the level of service on these corridors may reduce the bicycle crashes.

Similar to bicycle crash clusters, pedestrian crash clusters were more likely to occur in the urbanized areas. The five largest pedestrian crash clusters are listed in **Table 9**. The largest crash cluster within District Two occurred in Gainesville on West University Avenue (S.R. 26) from NW 19$^{th}$ Street to NW 6$^{th}$ Street. This 1-mile corridor had 49 crashes, 46 injuries, and 1 fatality. **Figure D4-1** shows the crash cluster locations that occurred in Alachua County. The second largest cluster occurred in downtown Jacksonville along Beaver Street, (U.S. 90), Union Street, and State Street from North Jefferson Street to North Washington Street. **Figure D4-7** shows the crash cluster locations that occurred in Duval County.

### Table 5: Top Five District Two Bicycle Crash Clusters

| Crashes in Cluster | City | Injuries | Fatalities | Roadway | Length of cluster (miles) | Highway LOS | Bicycle LOS | Pedestrian LOS |
|---|---|---|---|---|---|---|---|---|
| 45 | Gainesville | 40 | 2 | NW 13th Street (S.R. 25) | 1.26 | C and F | D | C and D |
| 27 | Jacksonville Beach | 24 | 1 | 3rd Street (S.R. A1A) | 0.63 | D and F | B, C, D, and E | D, E, and F |
| 19 | Gainesville | 18 | 0 | Main Street (S.R. 20 and S.R. 329) | 0.62 | C | C | C and D |
| 18 | Gainesville | 18 | 0 | SW 34th Street (S.R. 121) | 0.44 | C | C | D |
| | | | | Archer Road (S.R. 24) | 0.41 | C | D | D |
| 15 | Jacksonville | 15 | 0 | Beach Boulevard (S.R. 212) | 0.48 | C | C | F |

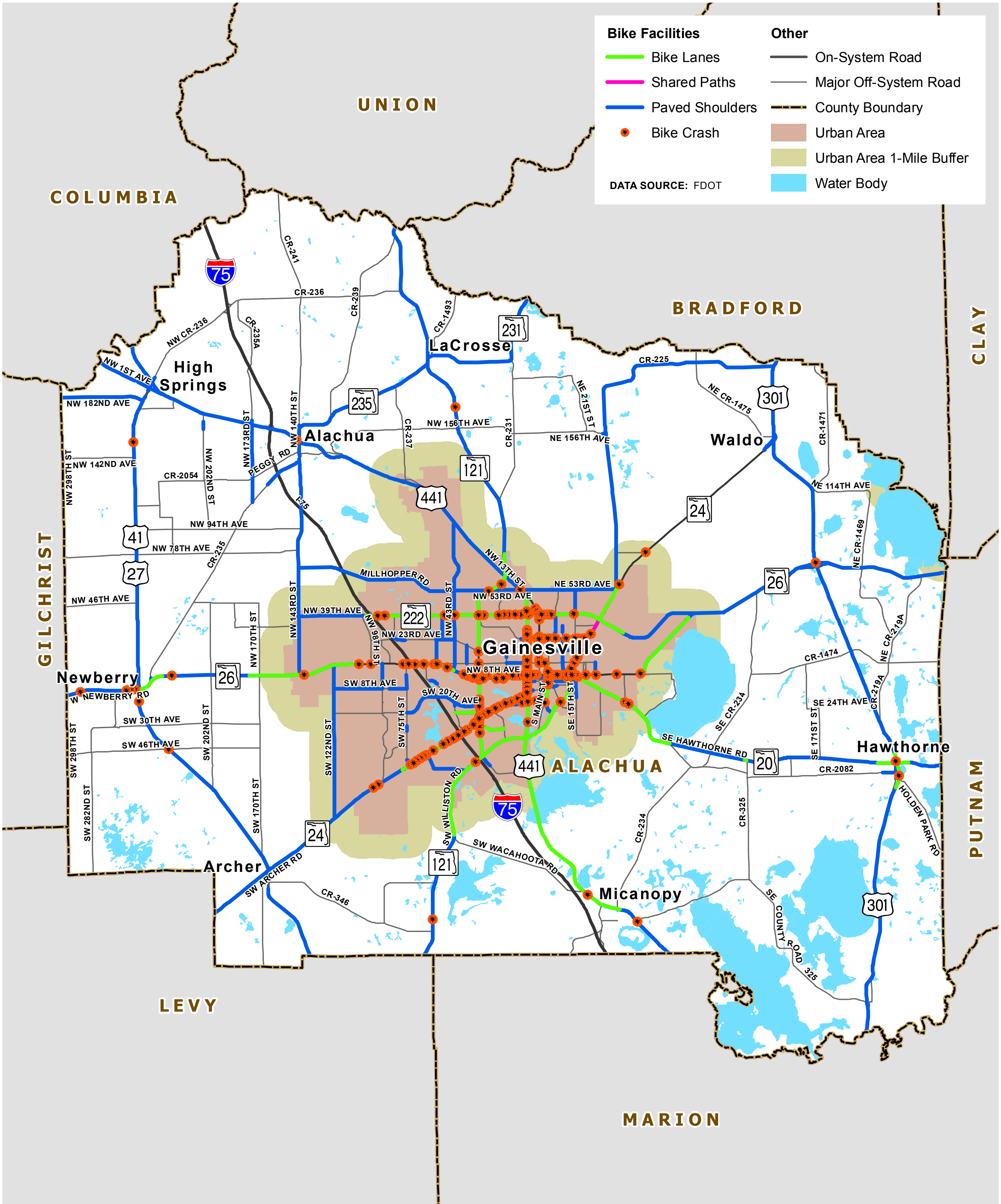
### Table 6: Top Five District Two Pedestrian Crash Clusters

| Crashes in Cluster | City | Injuries | Fatalities | Roadway | Length of cluster (miles) | Highway LOS | Bicycle LOS | Pedestrian LOS |
|---|---|---|---|---|---|---|---|---|
| 49 | Gainesville | 46 | 1 | University Avenue (S.R. 26) | 1.00 | D | D and E | C and D |
| | | | | U.S. 441 (S.R. 25) | 0.30 | C and F | D | C and D |
| 43 | Jacksonville | 39 | 3 | Beaver Street (S.R. 10) | 1.05 | C | C | B and D |
| | | | | Union Street (S.R. 139) | 1.02 | D | D | E |
| | | | | State Street (S.R. 139) | 0.85 | C and D | D and E | D, E, and F |
| | | | | Main Street (S.R. 5) | 0.17 | C | D | D and E |
| | | | | Ocean Street (S.R. 5) | 0.21 | C | C and D | D and E |
| 37 | Jacksonville | 35 | 0 | Forsyth Street (SIS facility) | 0.85 | C | NA | NA |
| | | | | Bay Street (S.R. 15) | 0.85 | C | NA | NA |
| | | | | Adams Street (S.R. 228 and SIS facility) | 0.54 | C | A | C |
| | | | | Main Street (S.R. 5) | 0.38 | C | C and D | D |
| | | | | Ocean Street (S.R. 5) | 0.33 | C | A, B, C and D | C and D |
| 29 | Jacksonville Beach | 27 | 3 | 3rd Street (S.R. A1A) | 0.63 | D and F | D and E | E and F |
| | | | | Beach Boulevard (S.R. 212) | 0.42 | D | D | E |
| 27 | Gainesville | 35 | 0 | University Avenue (S.R. 26) | 0.46 | D | D | C |
| | | | | Main Street (S.R. 329) | 0.36 | C | C | C and D |

West University Avenue from NW 19th Street to NW 6th Street is at LOS D; however, the intersection with NW 13th Street is at LOS F. Beaver Street is at LOS C, while Union Street and State Street are at LOS D.

Both Gainesville and Jacksonville have bicycle and pedestrian plans; however, it is unknown if those plans identified these same corridors as having a higher proportion of bicycle and pedestrian crashes. It is also unknown if safety improvements have been planned for these same corridors.

The crash clusters were added as more information. No additional analysis was completed beyond identifying the crash clusters. Common trends or potential countermeasures may be done as part of a future study, which is outside the scope of this report. Also, the actual crash reports should be collected and analyzed for any future analysis or recommended improvements.

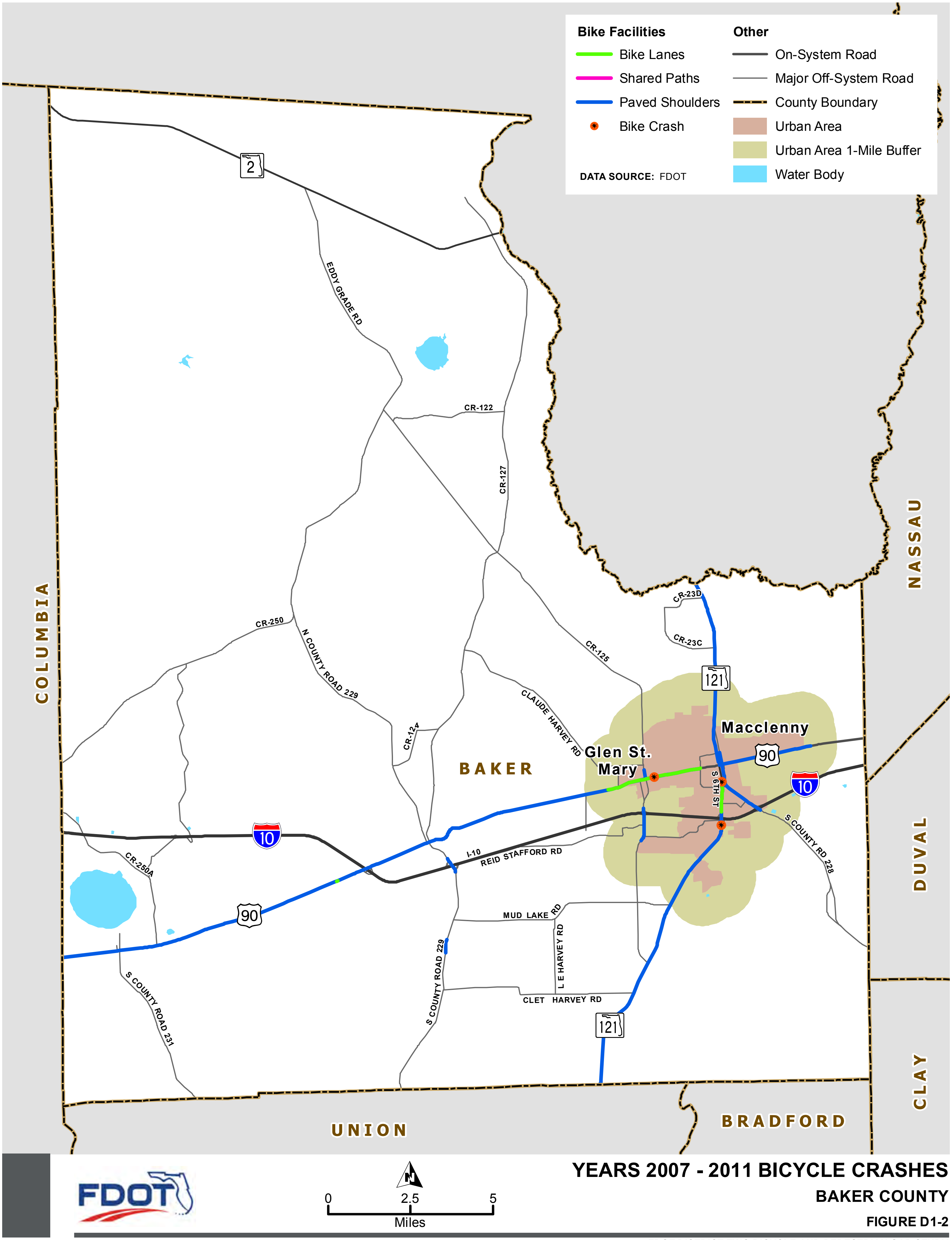



# YEARS 2007 - 2011 BICYCLE CRASHES

## ALACHUA COUNTY

FIGURE D1-1

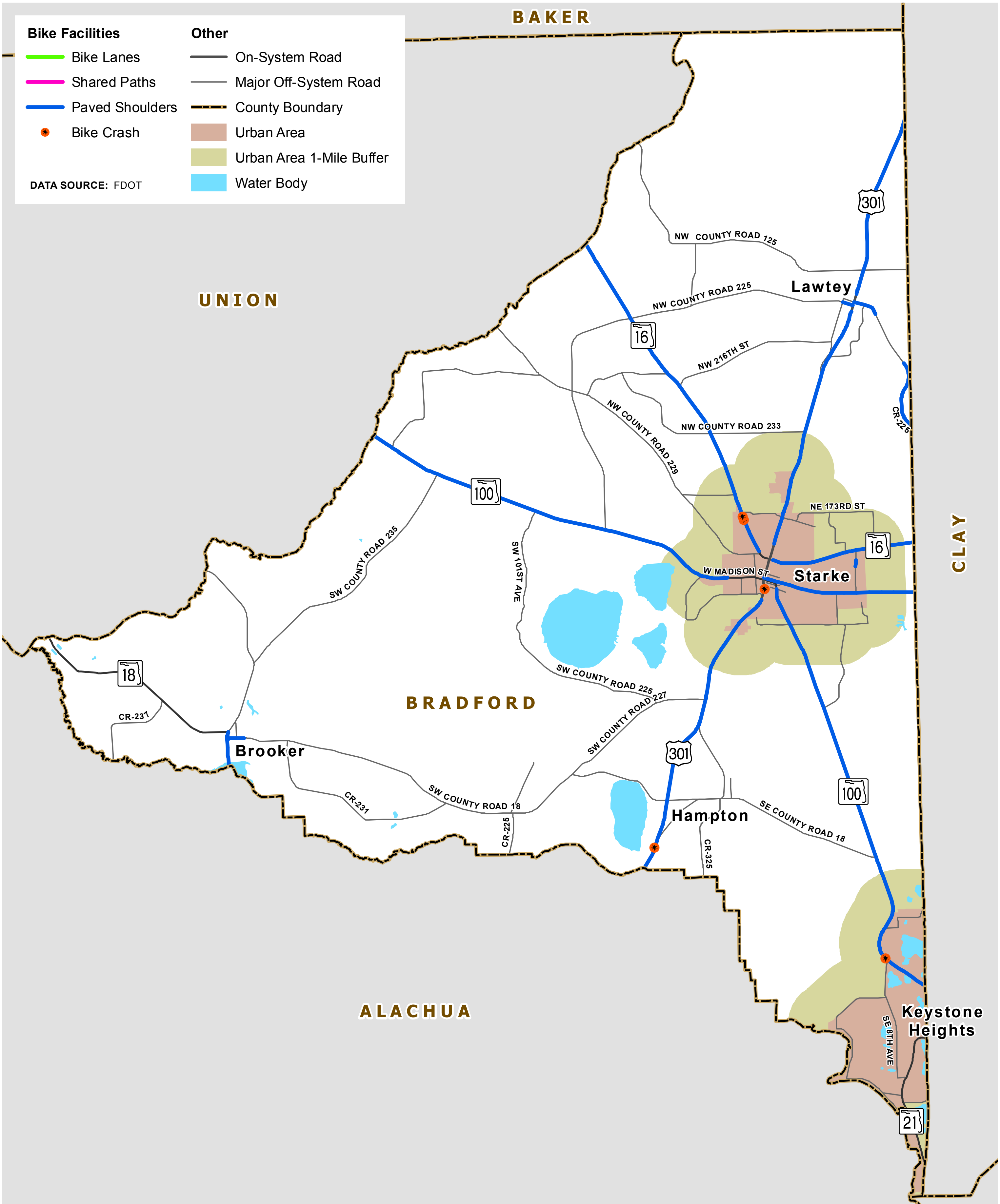
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# YEARS 2007 - 2011 BICYCLE CRASHES

## BAKER COUNTY

FIGURE D1-2

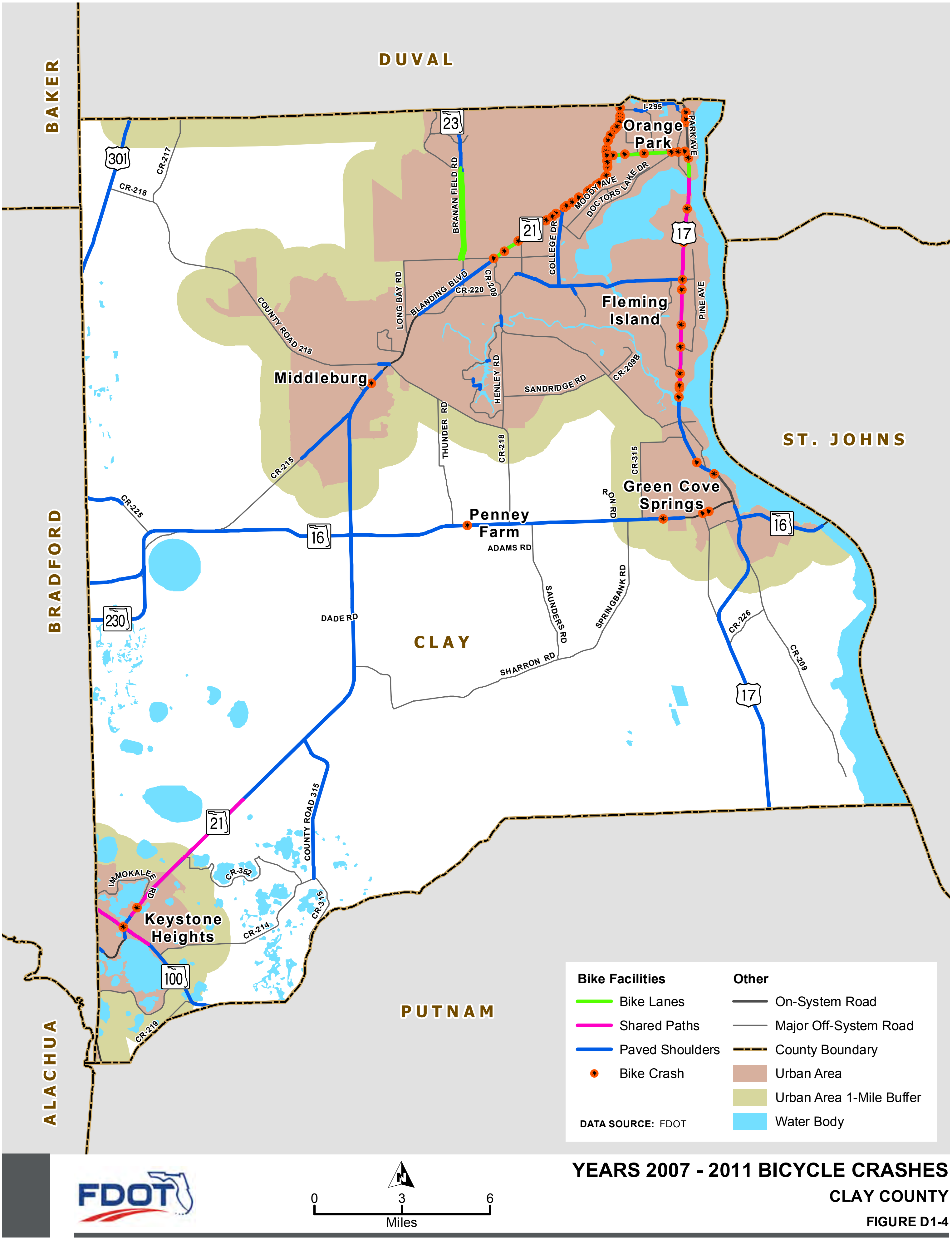



FDOT

# YEARS 2007 - 2011 BICYCLE CRASHES

## BRADFORD COUNTY

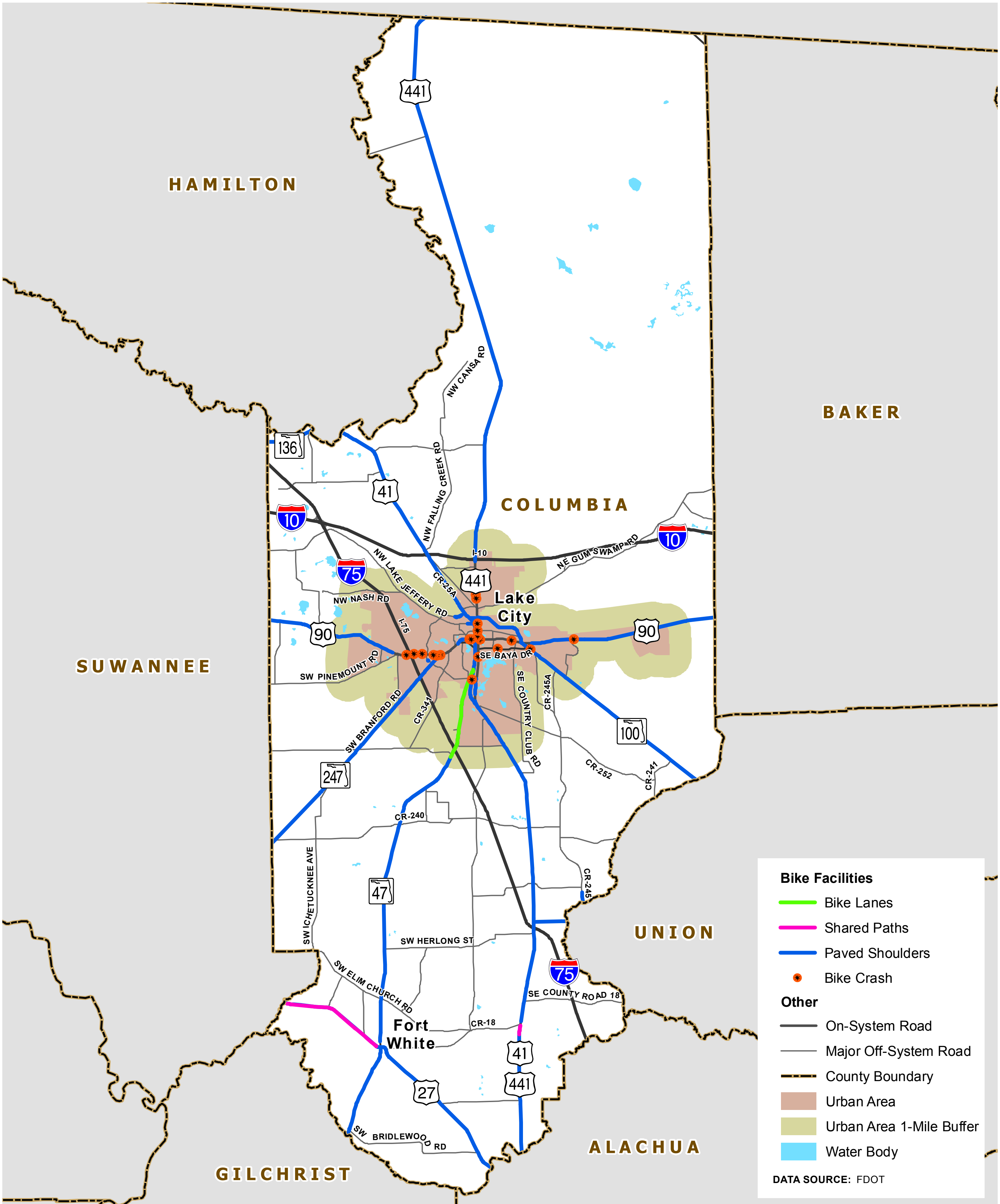
FIGURE D1-3




# YEARS 2007 - 2011 BICYCLE CRASHES

## CLAY COUNTY

FIGURE D1-4

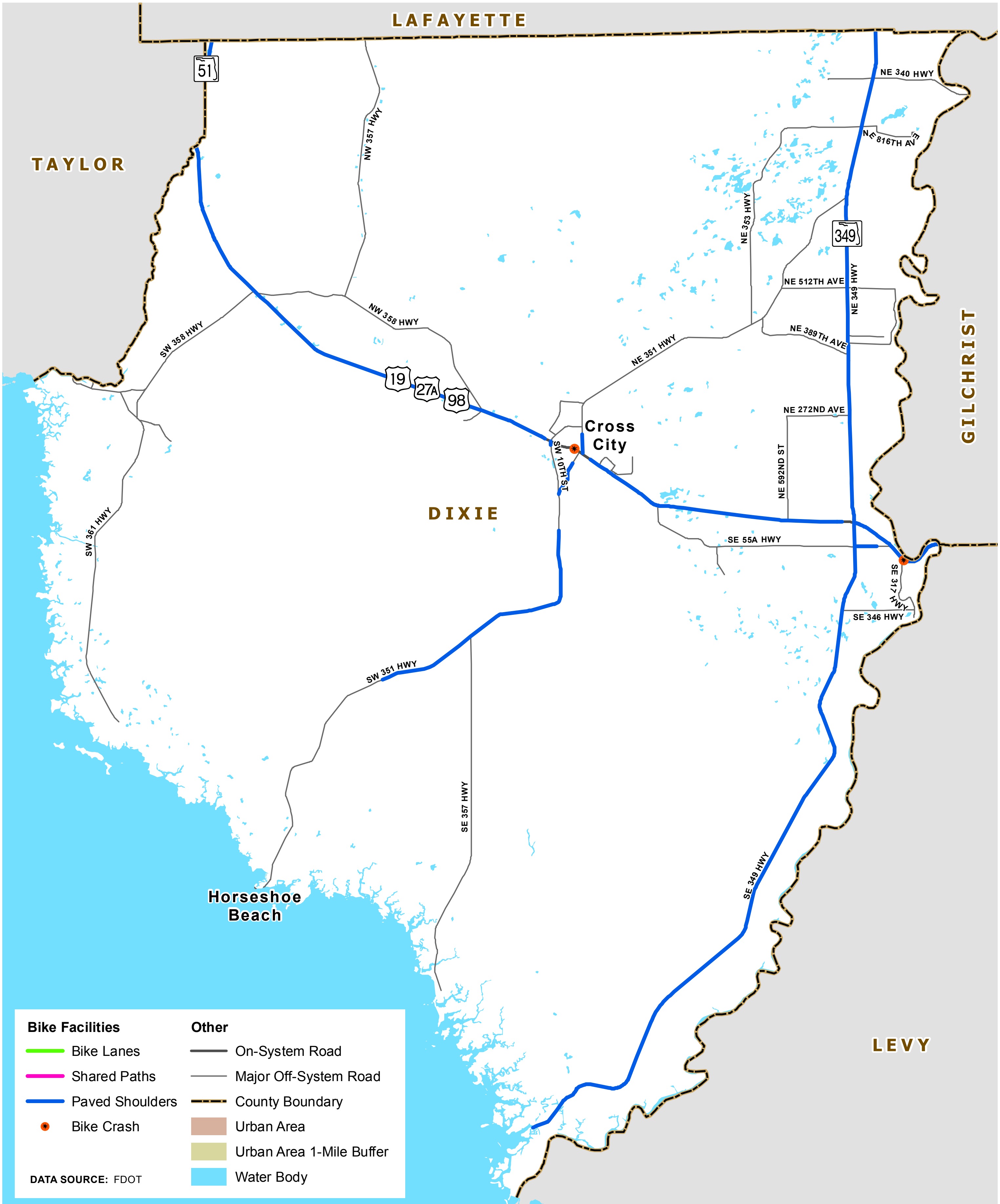



FDOT

# YEARS 2007 - 2011 BICYCLE CRASHES

## COLUMBIA COUNTY

FIGURE D1-5

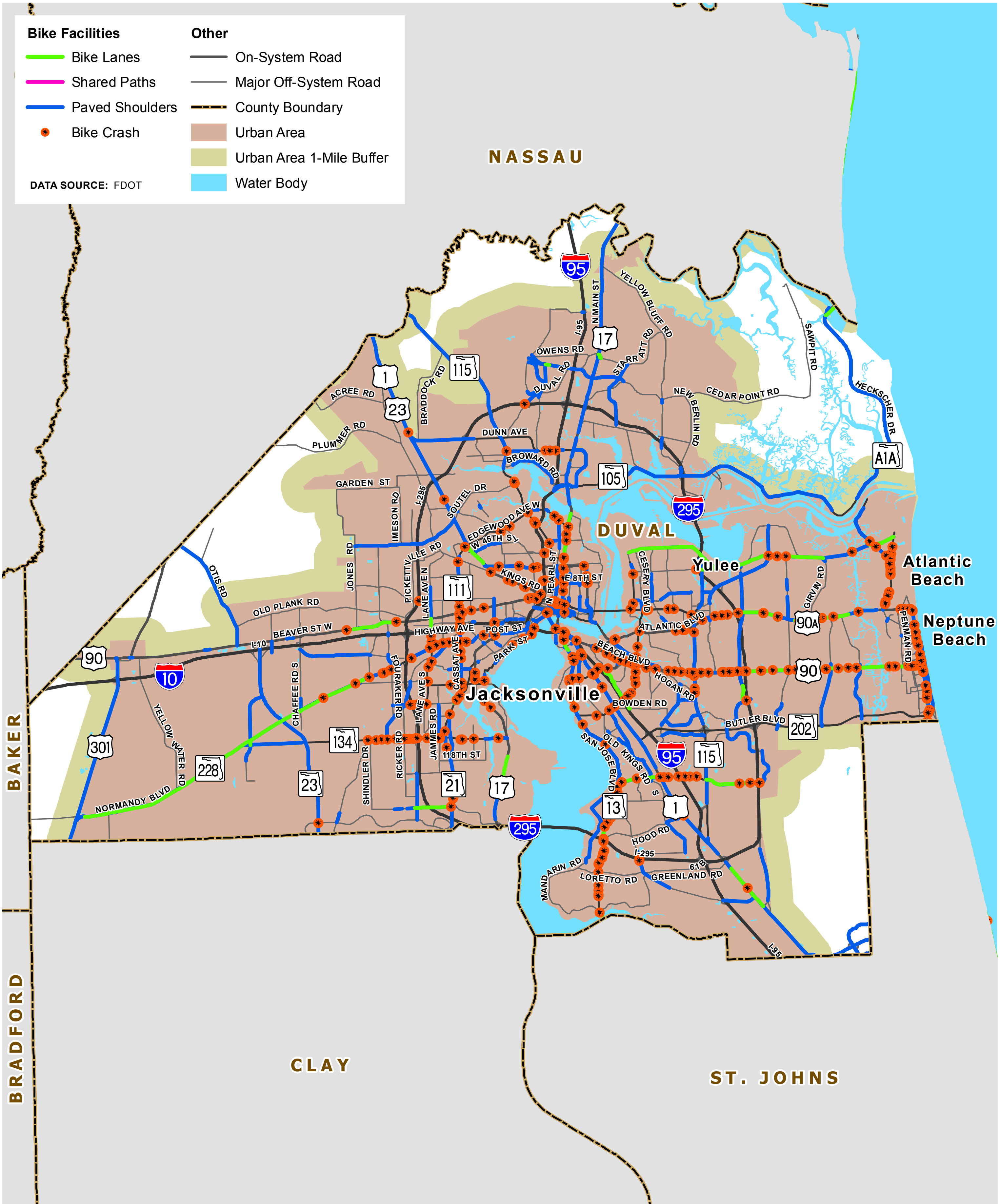



FDOT

# YEARS 2007 - 2011 BICYCLE CRASHES

## DIXIE COUNTY

FIGURE D1-6

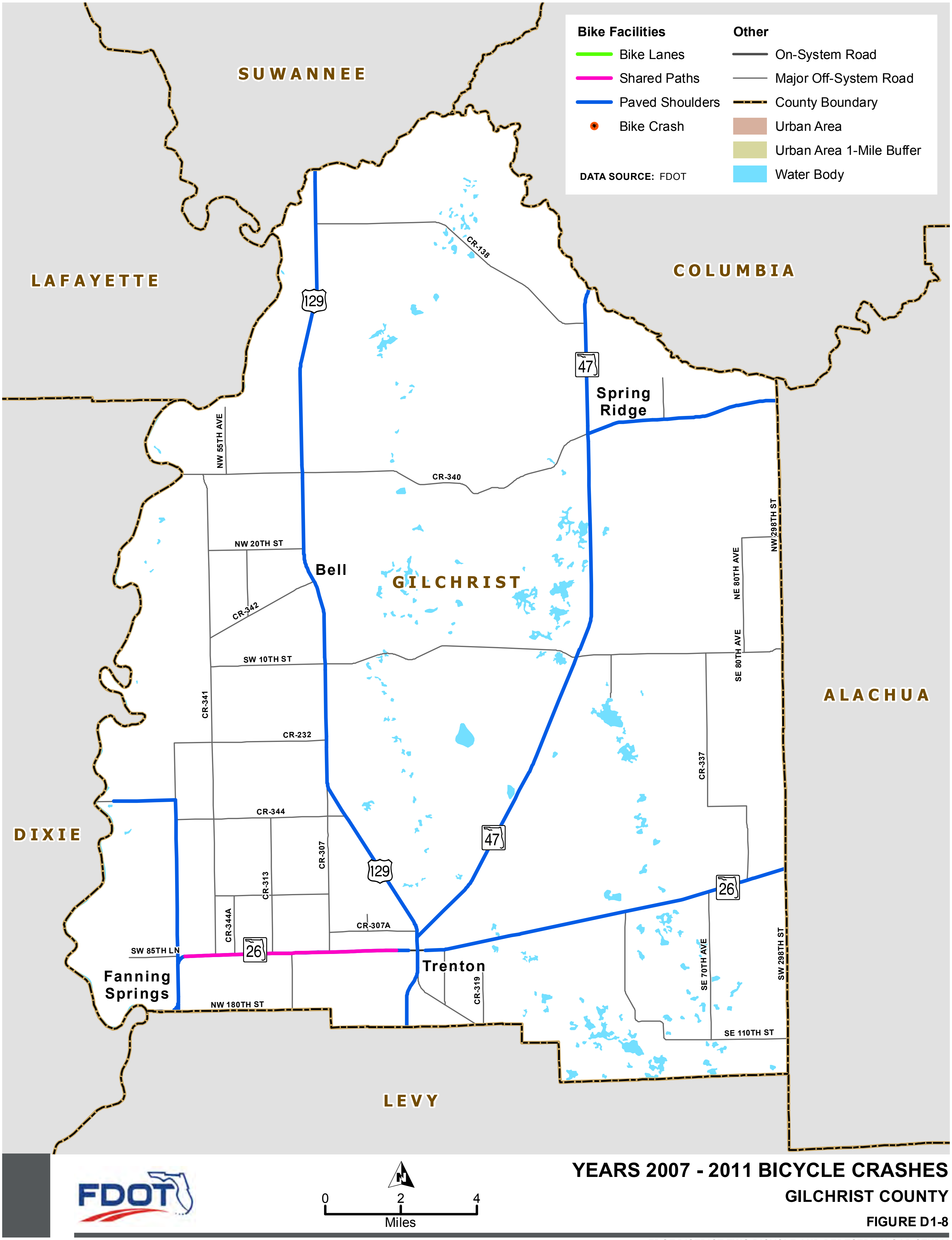



0 4 8
Miles

# YEARS 2007 - 2011 BICYCLE CRASHES

## DUVAL COUNTY

FIGURE D1-7

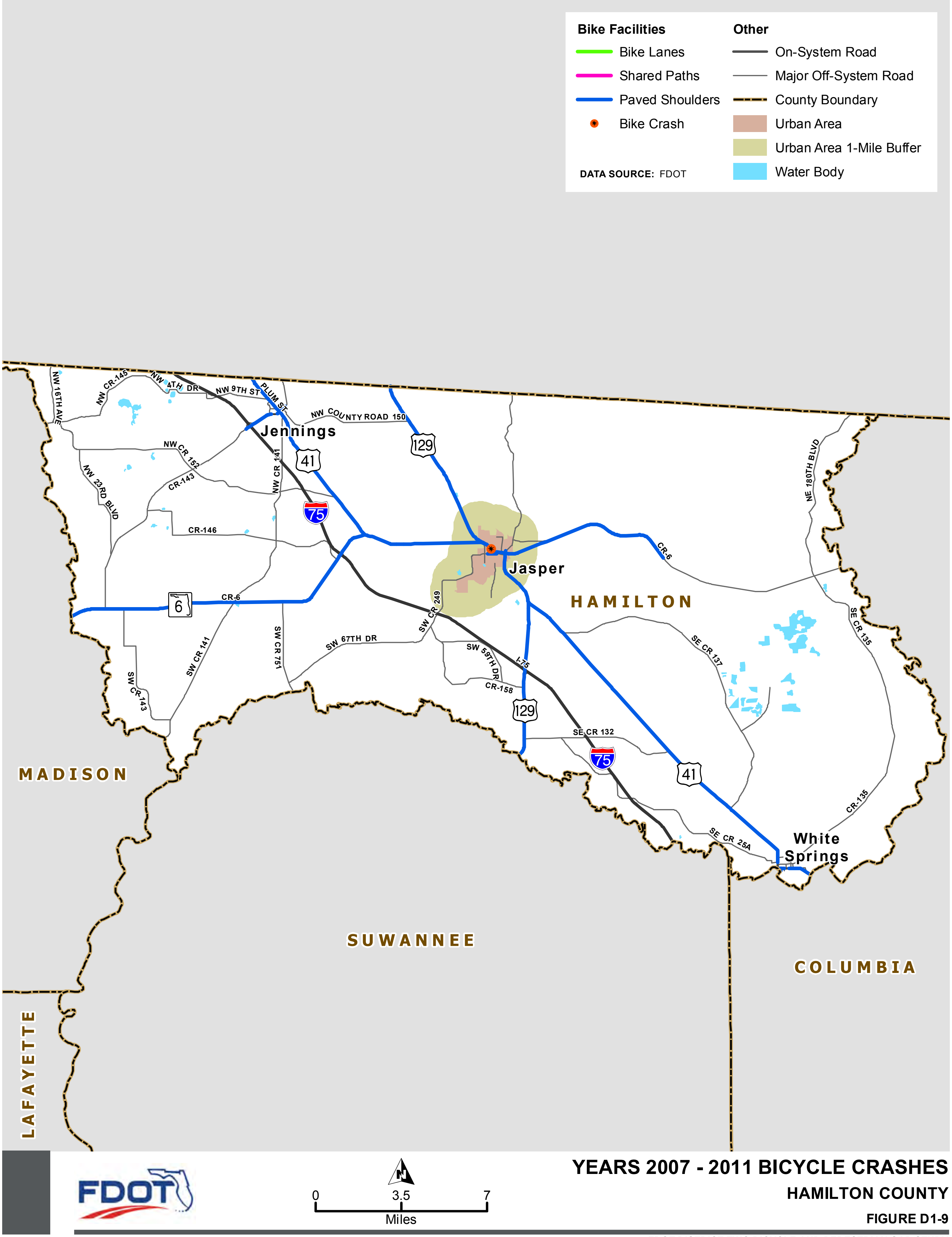



# YEARS 2007 - 2011 BICYCLE CRASHES

## GILCHRIST COUNTY

FIGURE D1-8

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

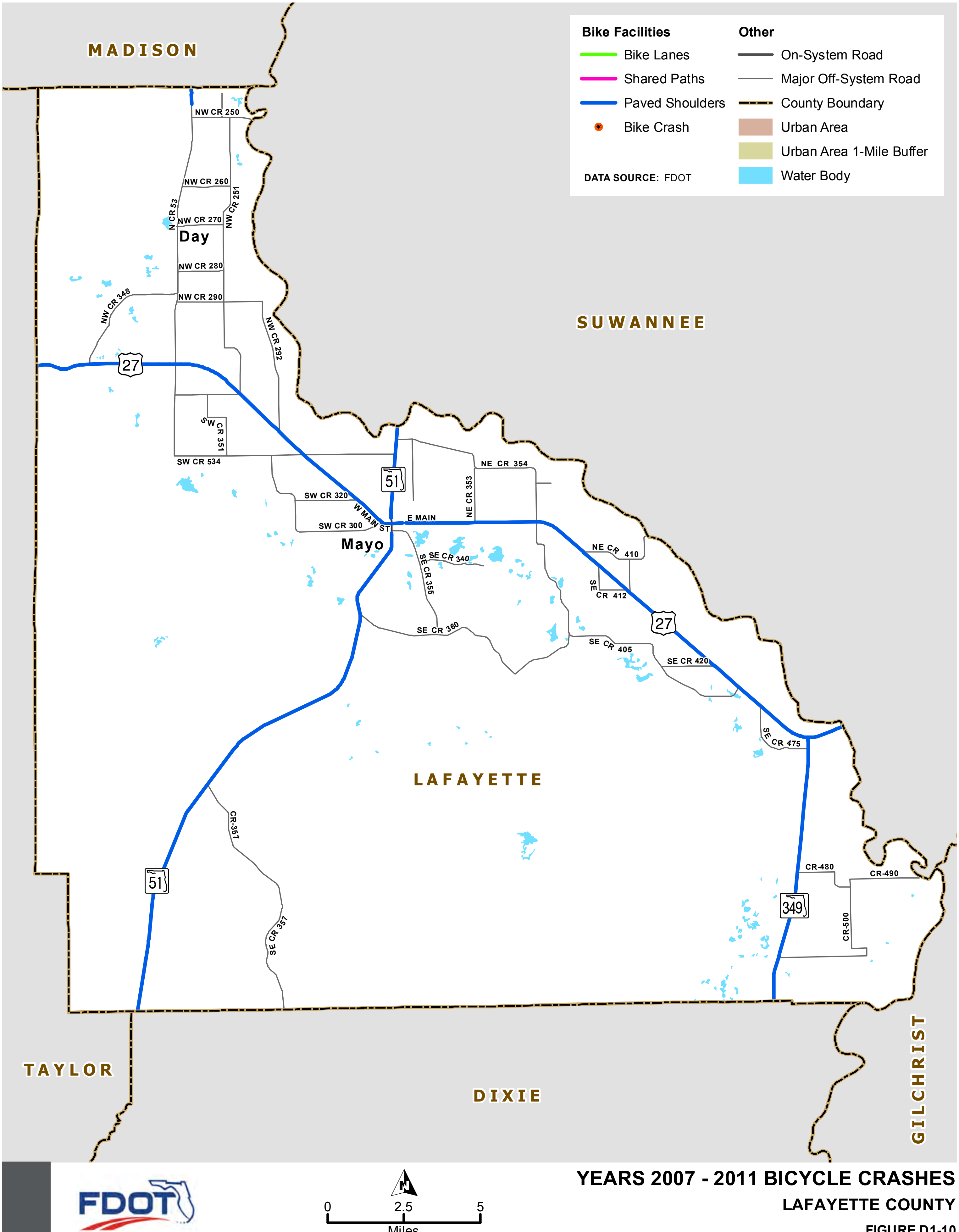


YEARS 2007 - 2011 BICYCLE CRASHES

HAMILTON COUNTY

FIGURE D1-9

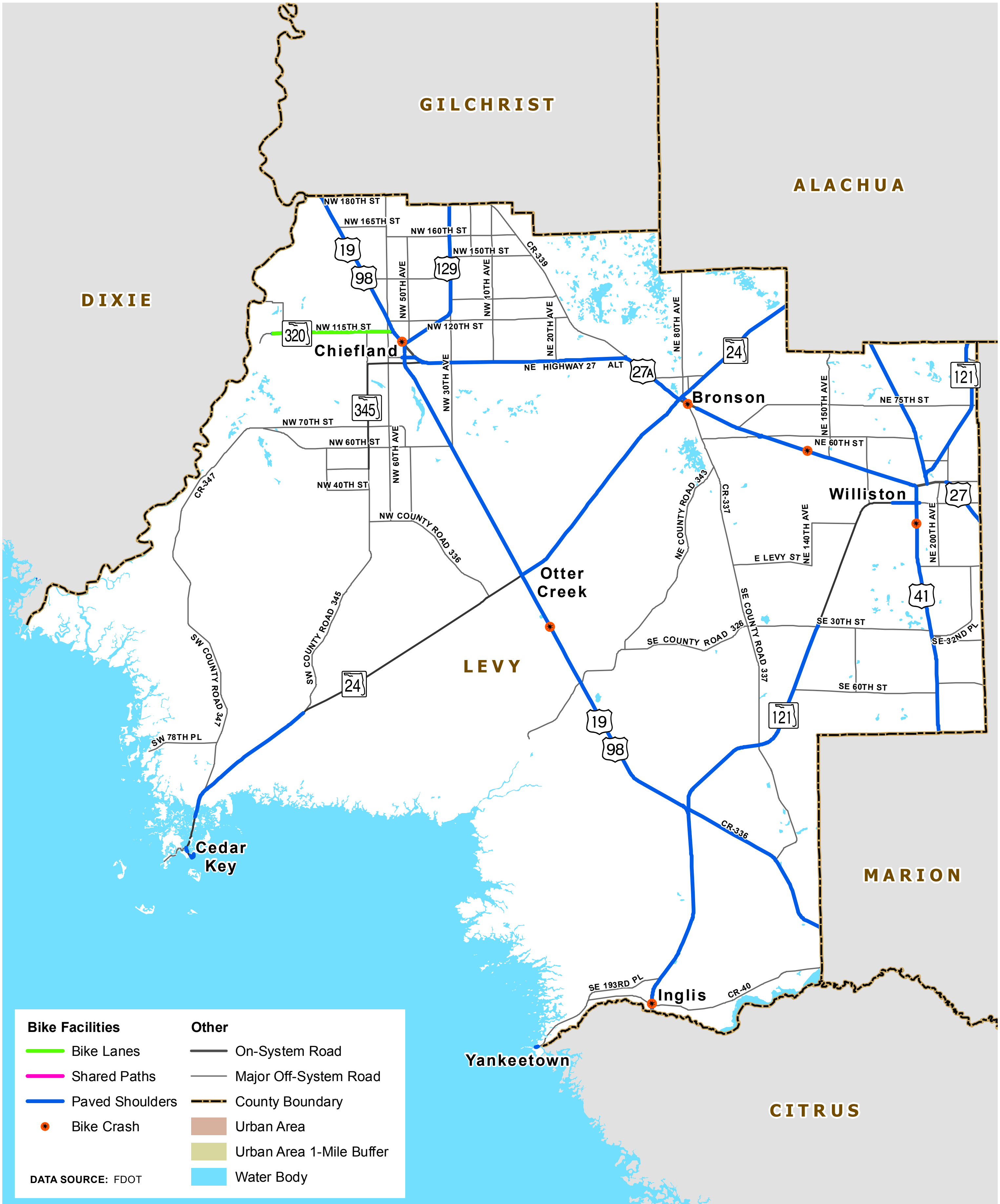
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# YEARS 2007 - 2011 BICYCLE CRASHES

## LAFAYETTE COUNTY

FIGURE D1-10

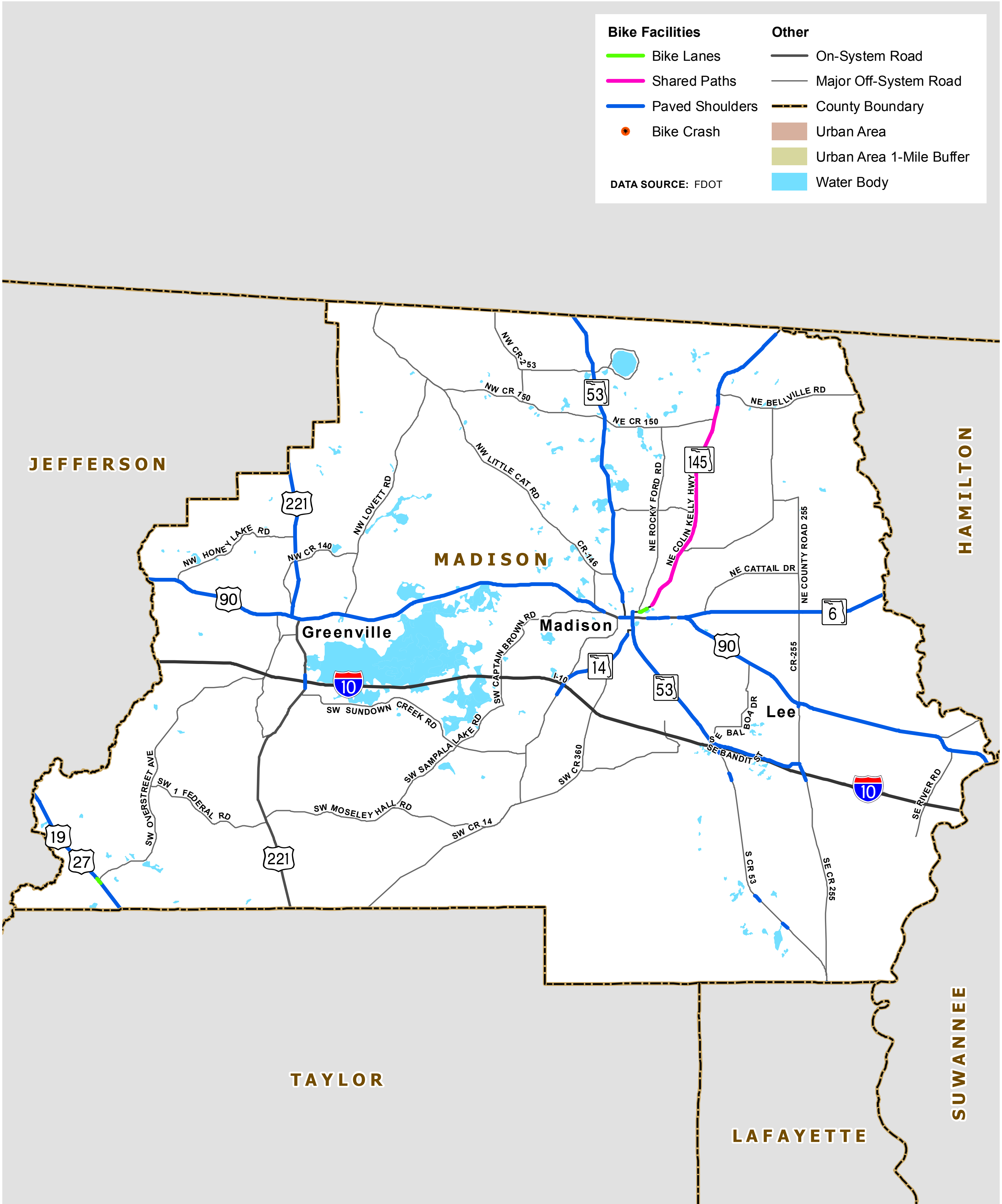



0 4.5 9
Miles

# YEARS 2007 - 2011 BICYCLE CRASHES

## LEVY COUNTY

**FIGURE D1-11**

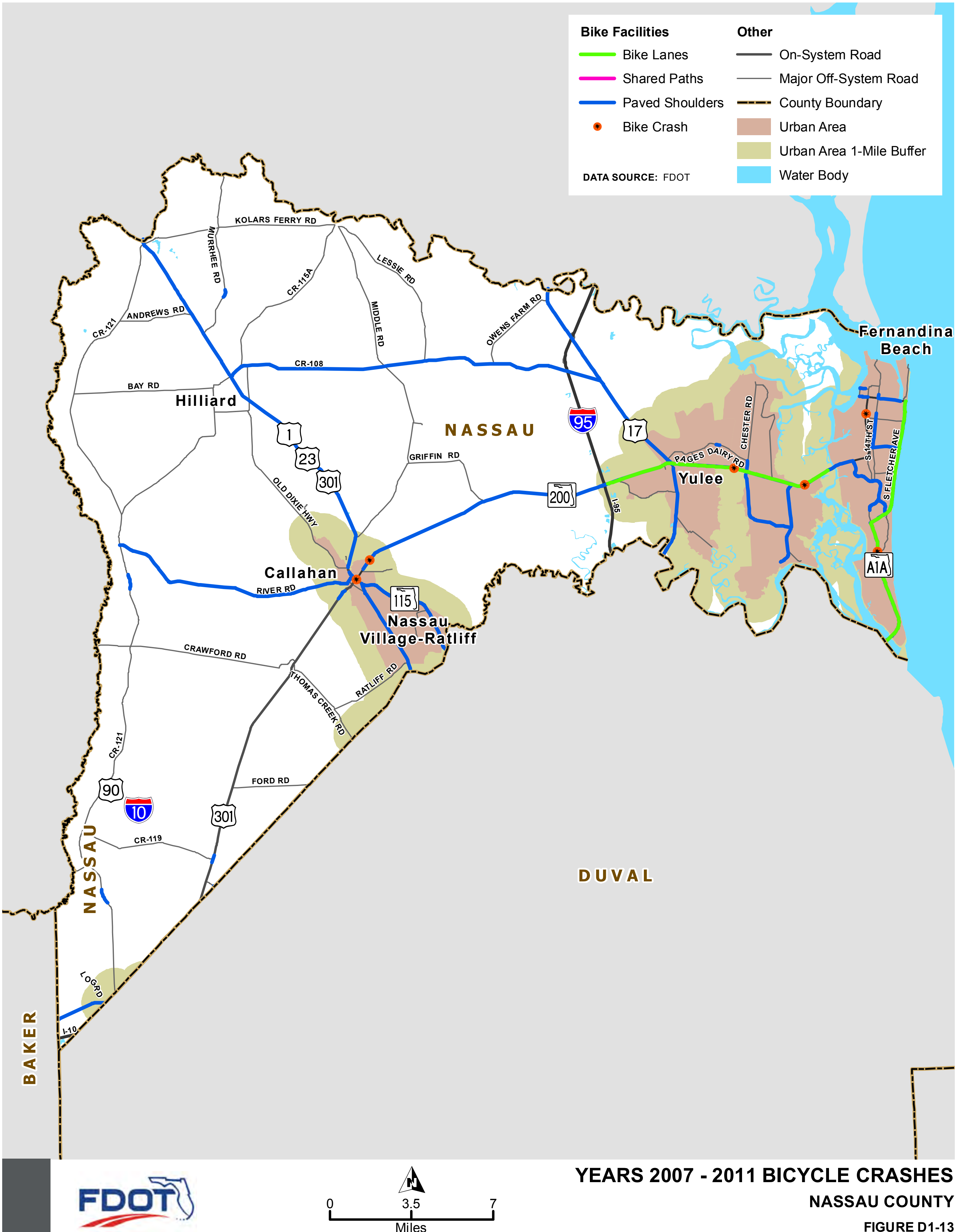



0 3.5 7
Miles

**YEARS 2007 - 2011 BICYCLE CRASHES**

**MADISON COUNTY**

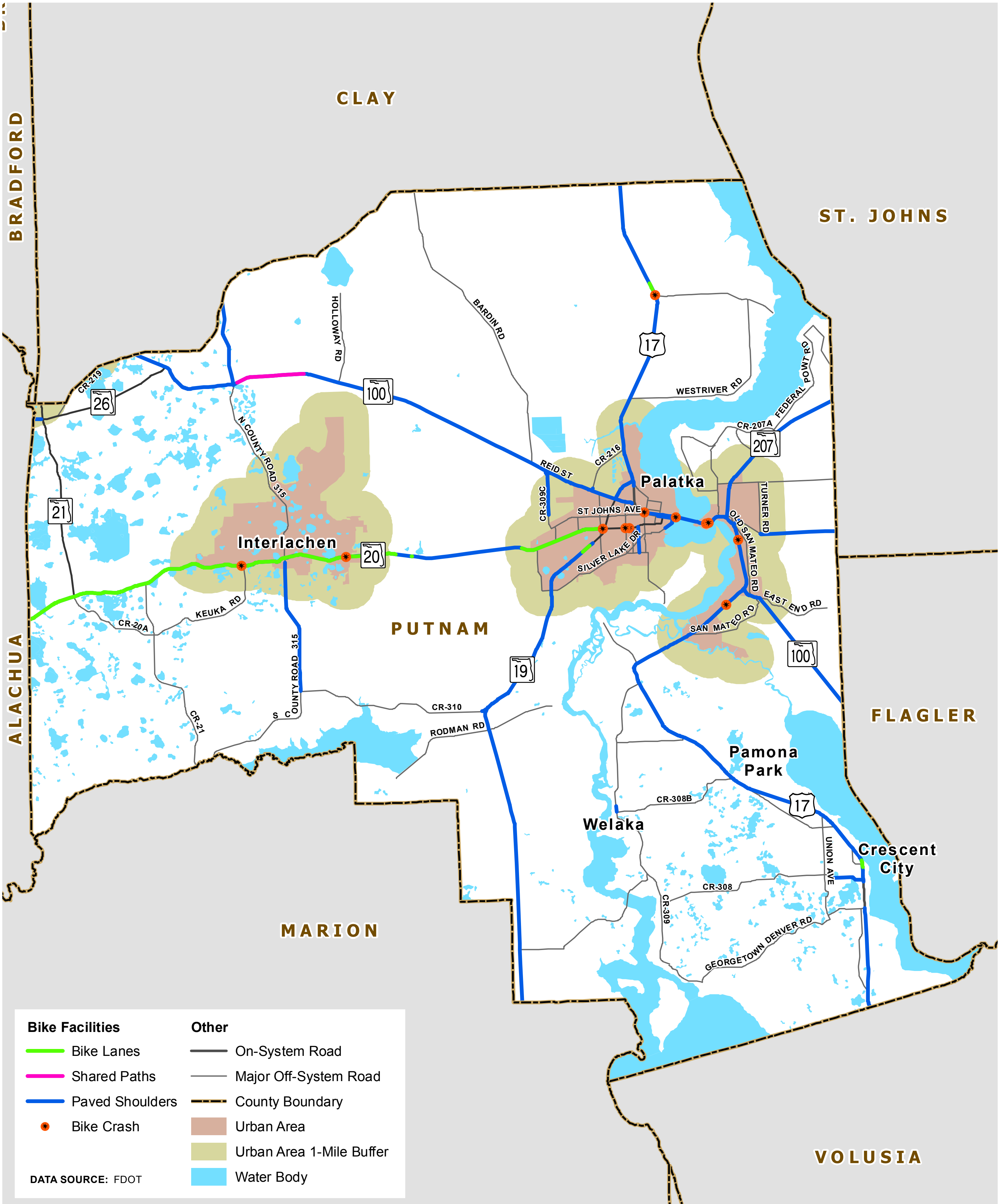
**FIGURE D1-12**




# YEARS 2007 - 2011 BICYCLE CRASHES

## NASSAU COUNTY

**FIGURE D1-13**

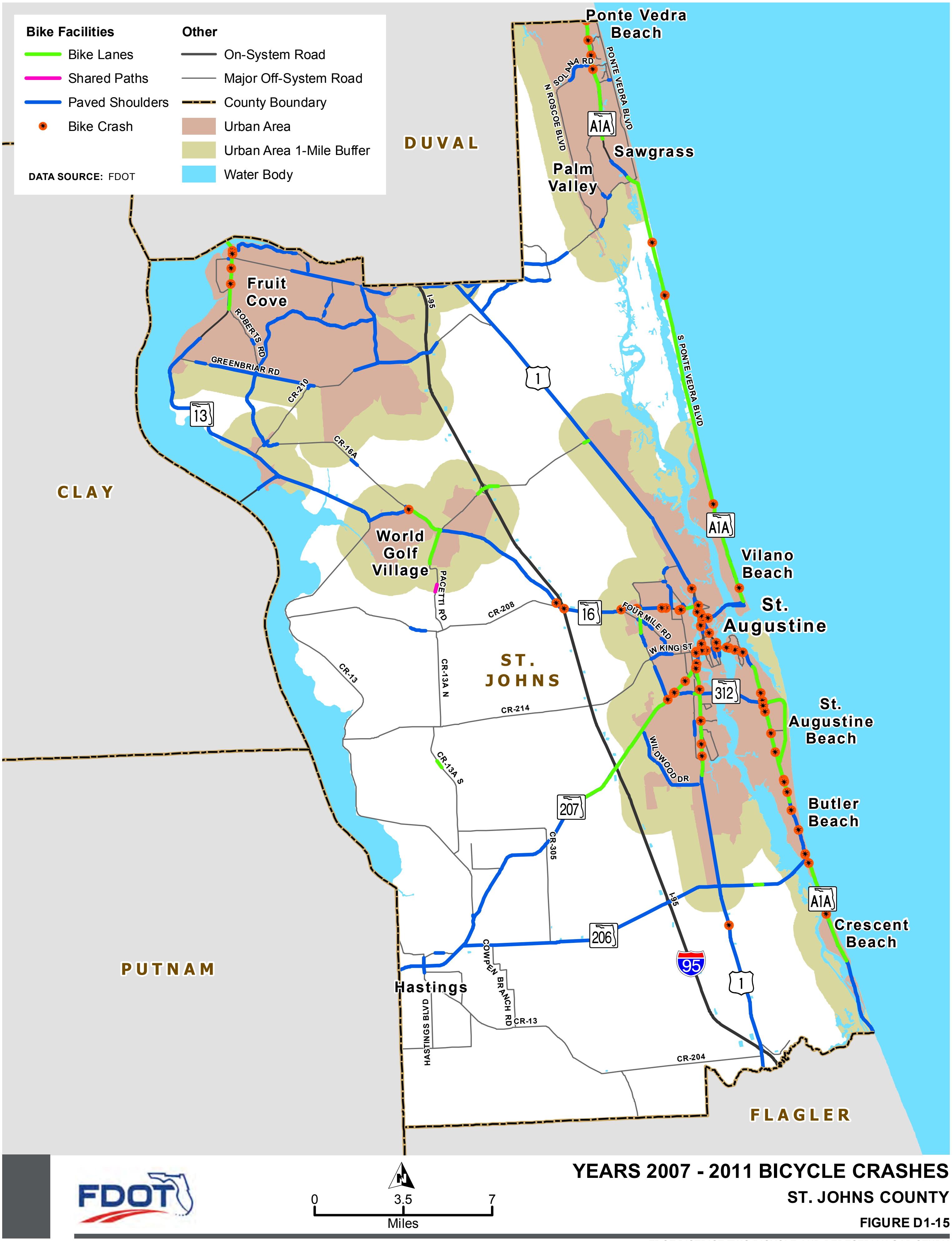



FDOT

**YEARS 2007 - 2011 BICYCLE CRASHES**

**PUTNAM COUNTY**

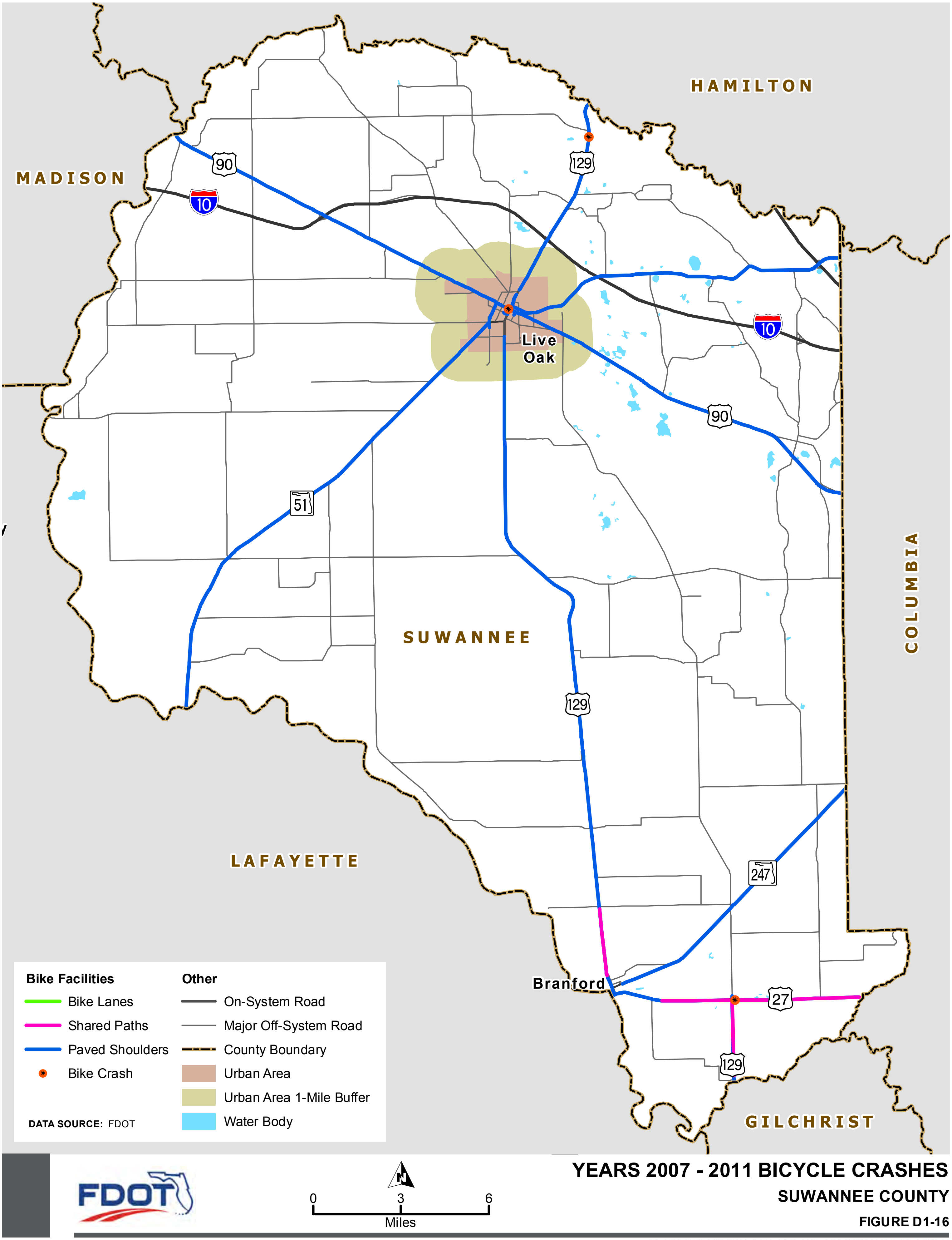
**FIGURE D1-14**




YEARS 2007 - 2011 BICYCLE CRASHES

ST. JOHNS COUNTY

FIGURE D1-15

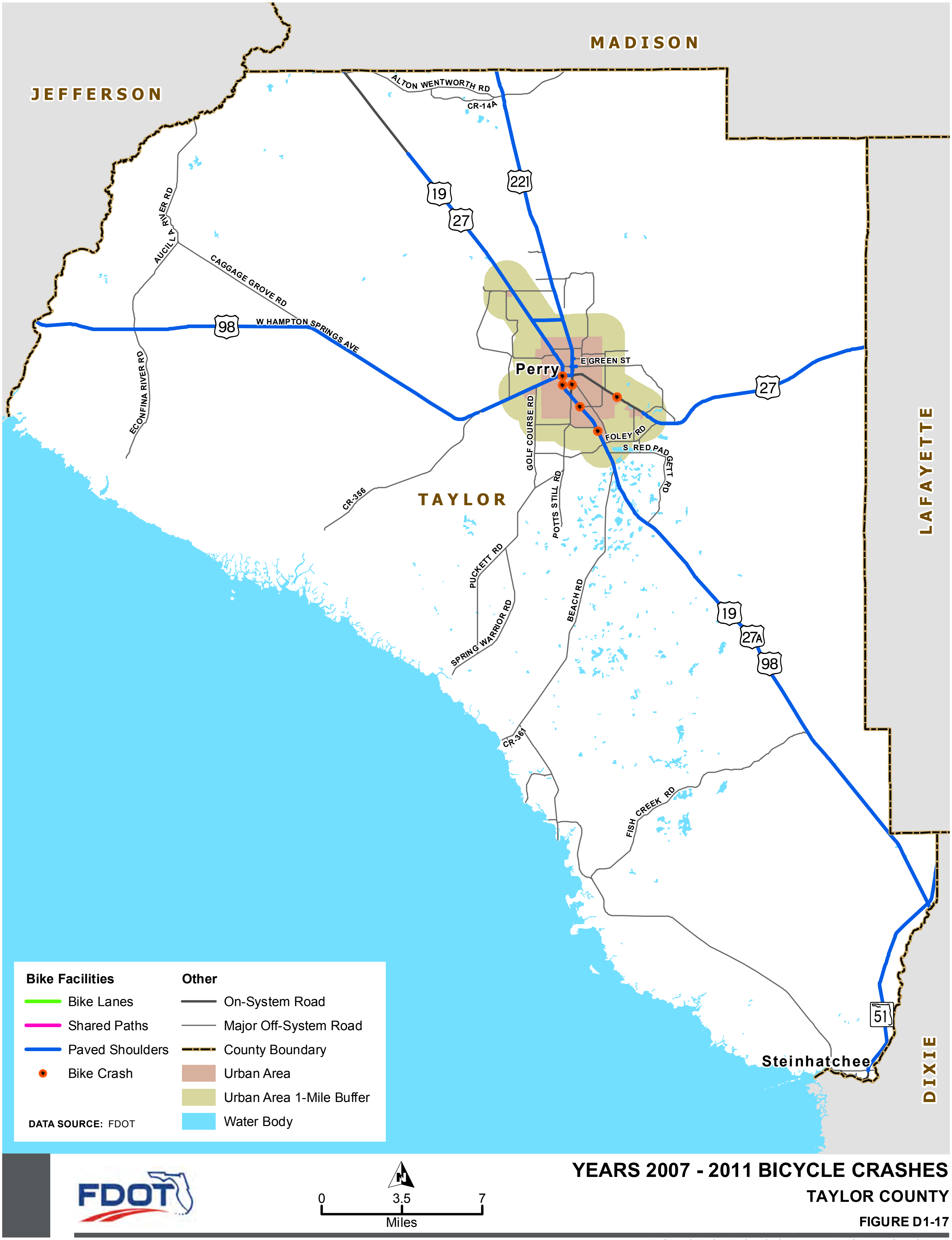



FDOT

# YEARS 2007 - 2011 BICYCLE CRASHES

## SUWANNEE COUNTY

FIGURE D1-16

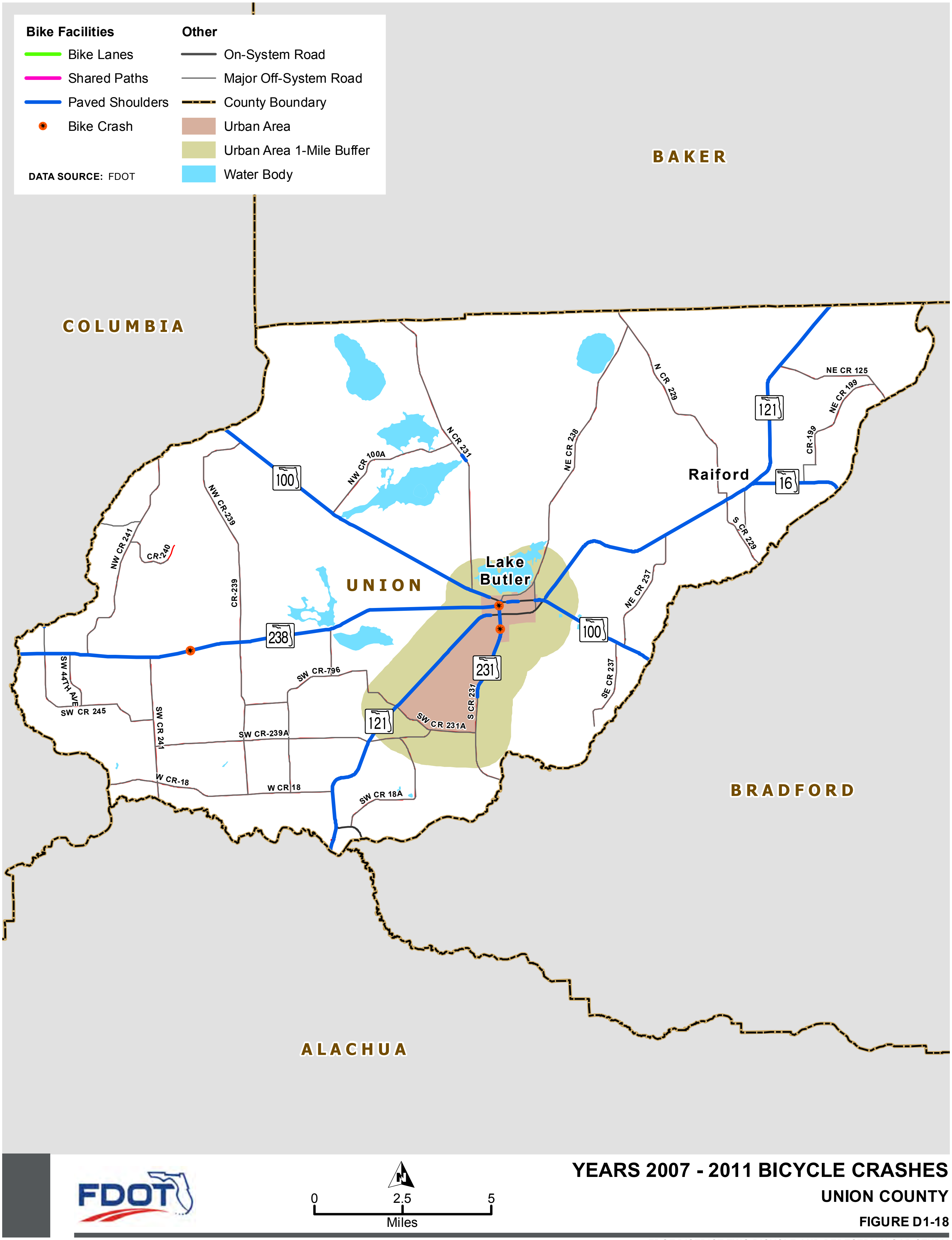



# YEARS 2007 - 2011 BICYCLE CRASHES

## TAYLOR COUNTY

FIGURE D1-17

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

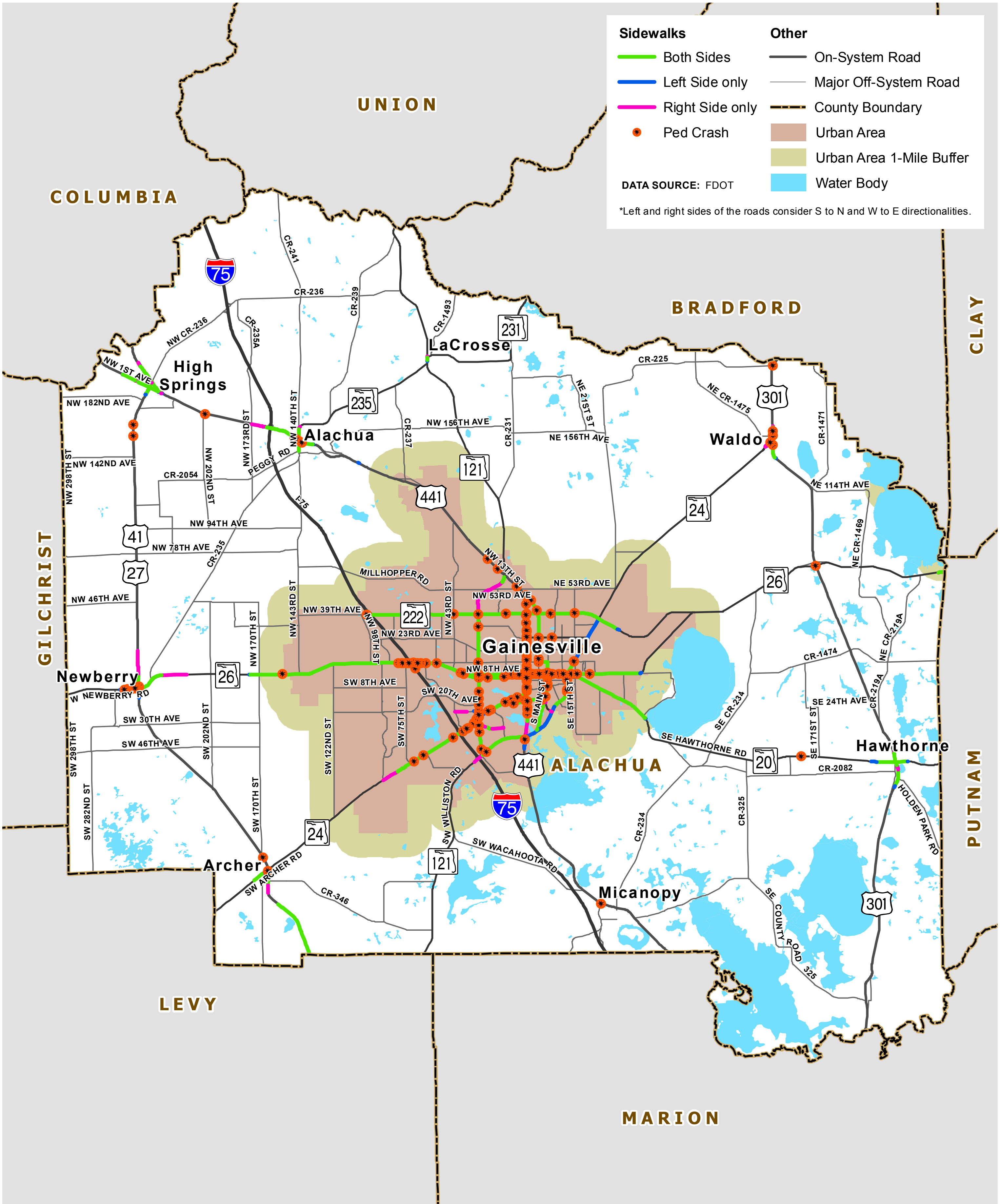



# YEARS 2007 - 2011 BICYCLE CRASHES

## UNION COUNTY

FIGURE D1-18

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

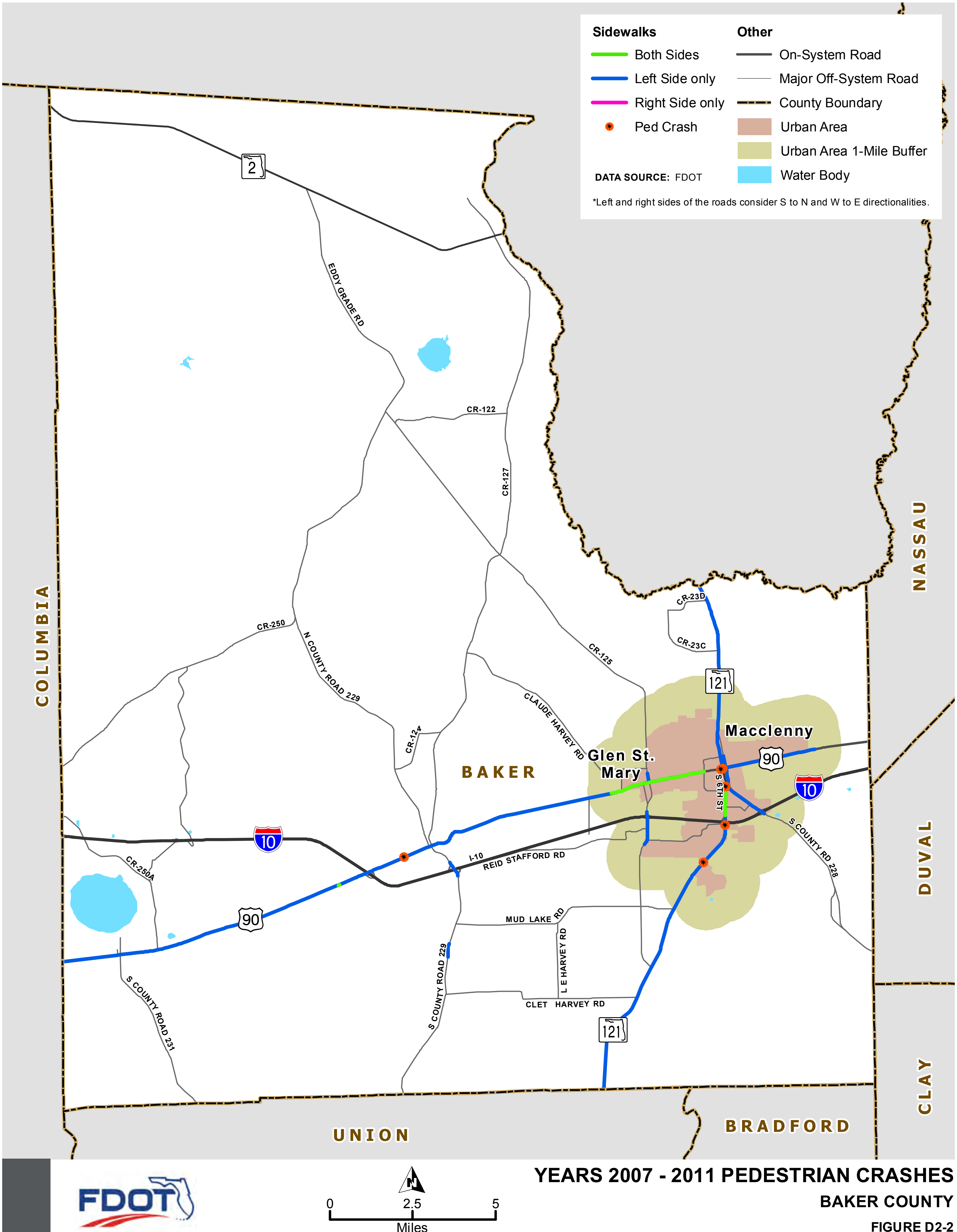



0 3.5 7
Miles

# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## ALACHUA COUNTY

FIGURE D2-1

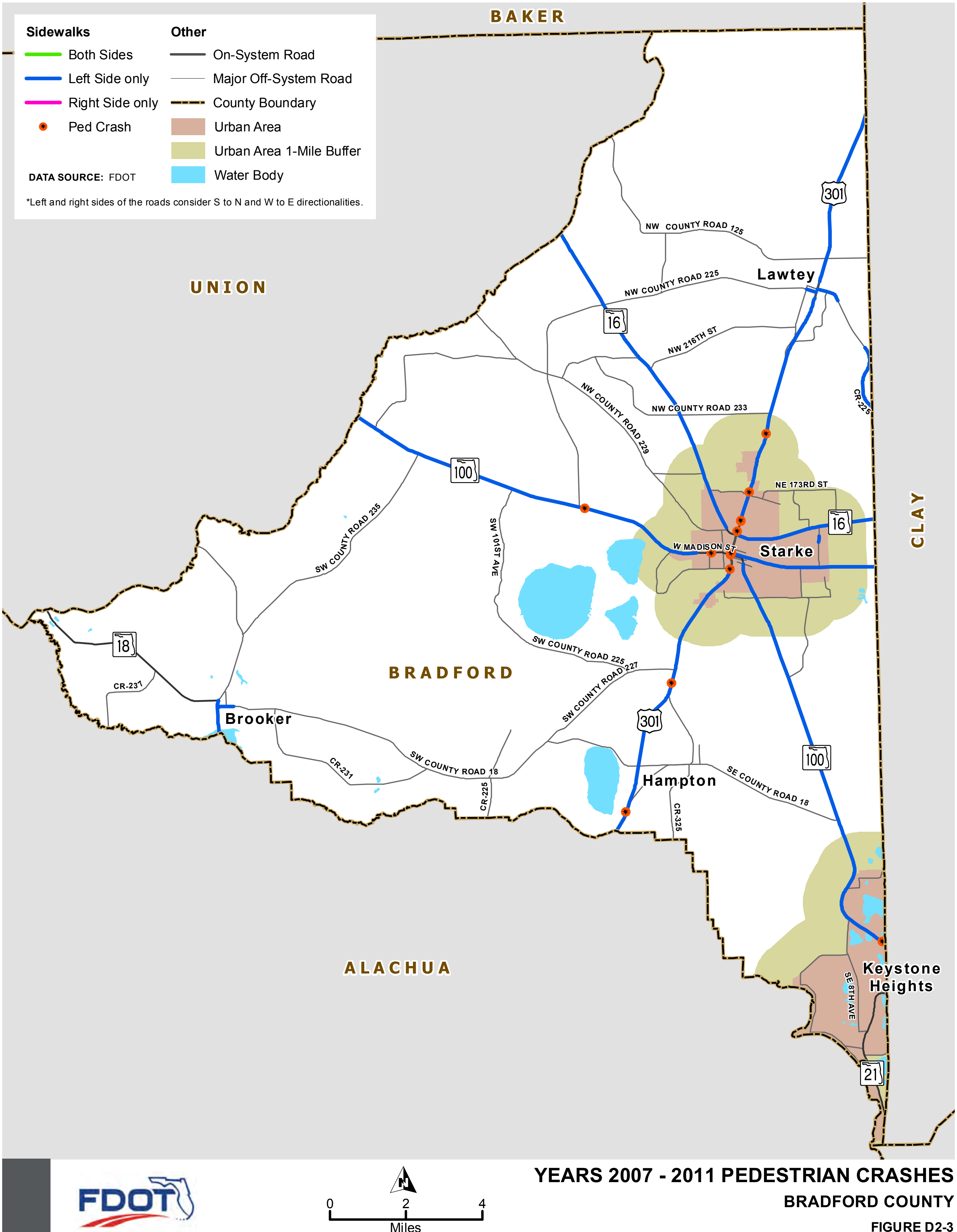



# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## BAKER COUNTY

FIGURE D2-2

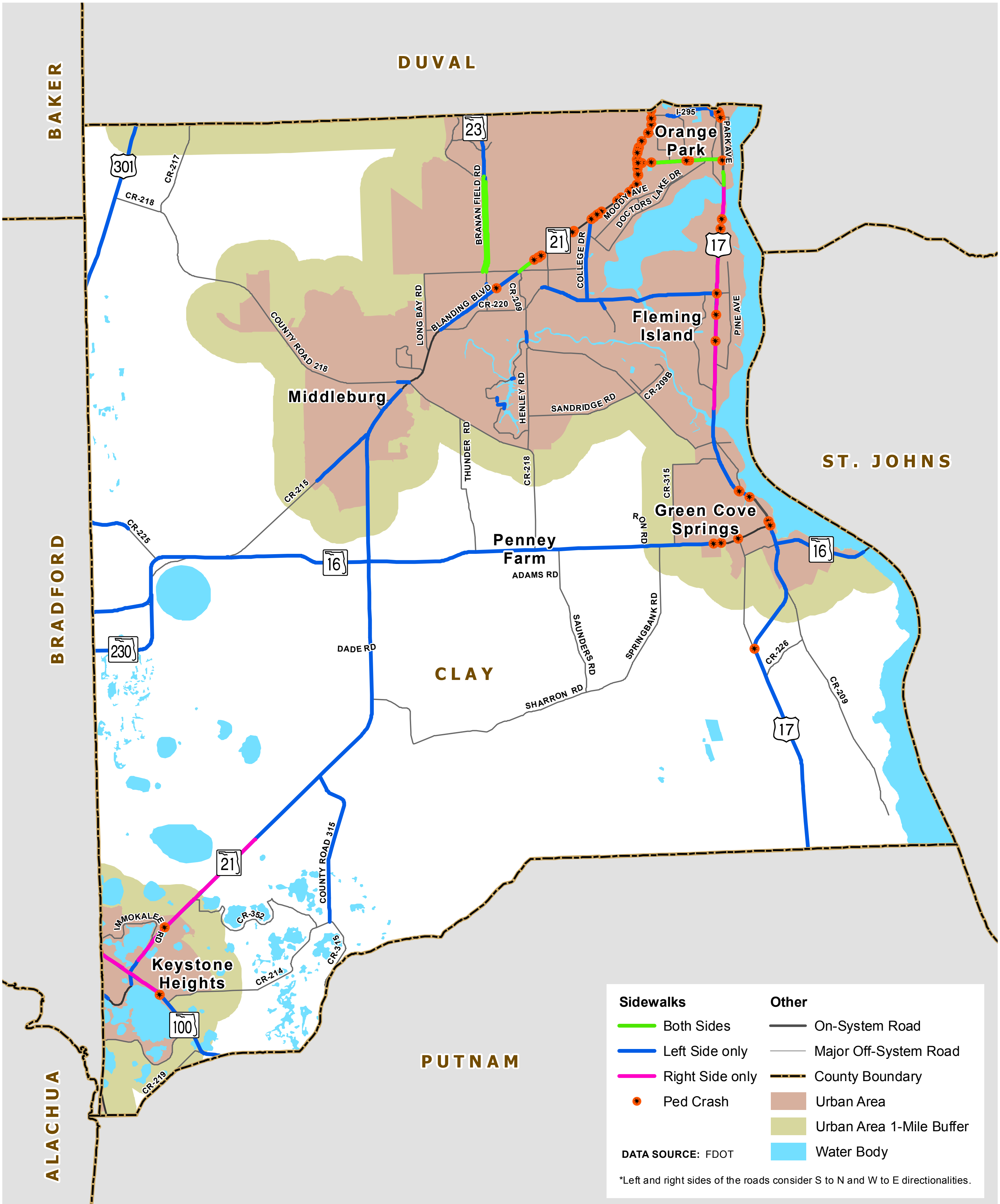
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## BRADFORD COUNTY

FIGURE D2-3

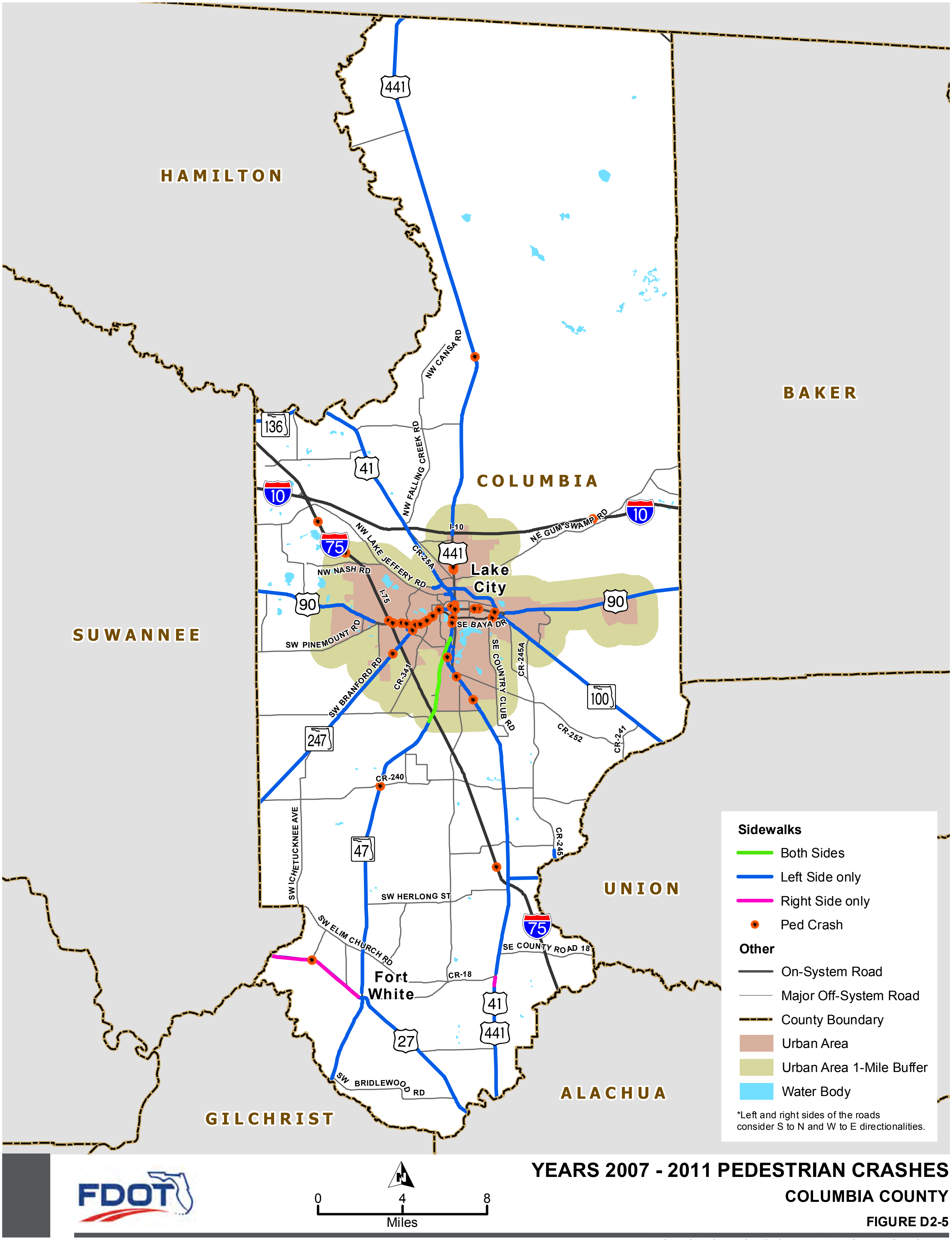



FDOT

# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## CLAY COUNTY

FIGURE D2-4

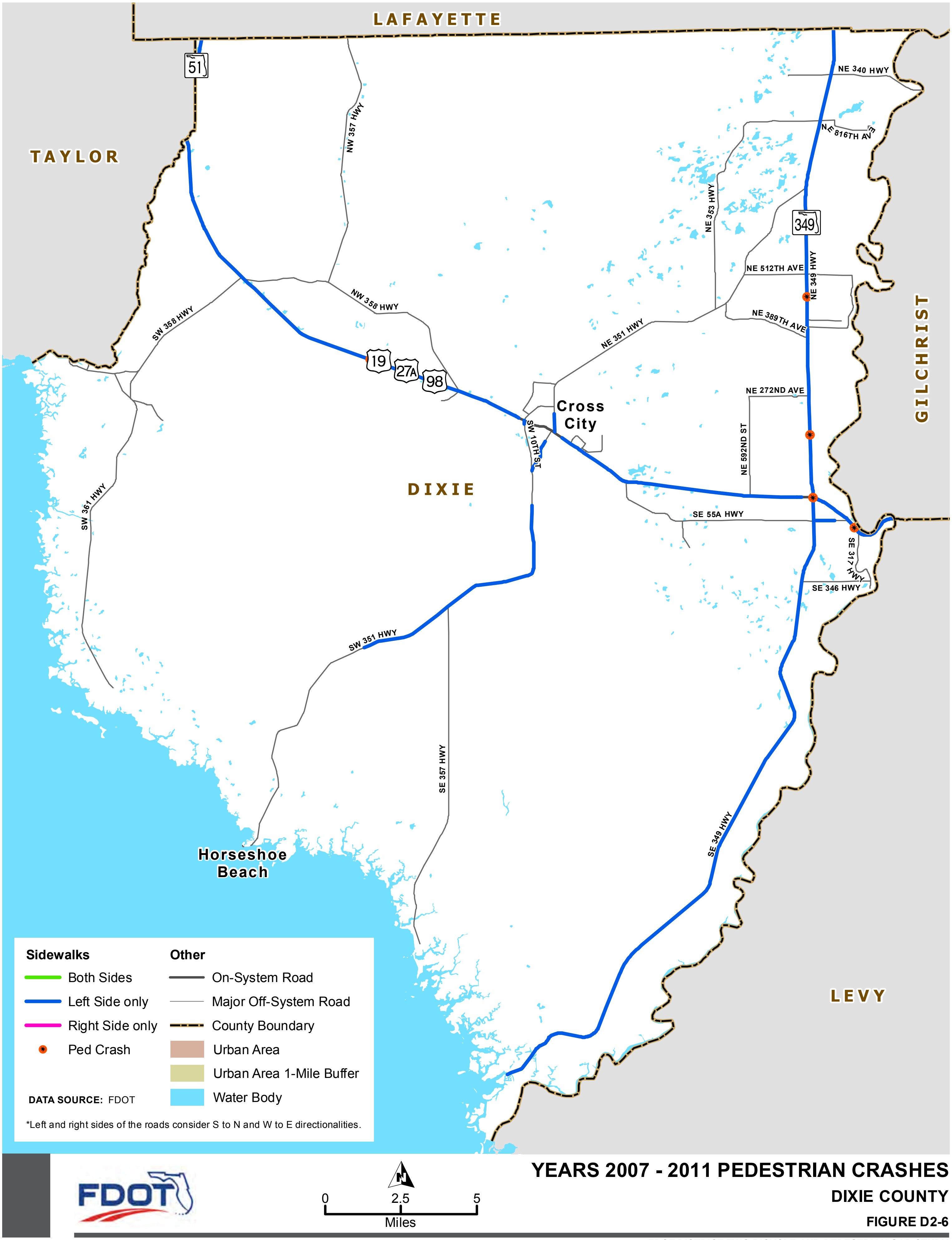



FDOT

# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## COLUMBIA COUNTY

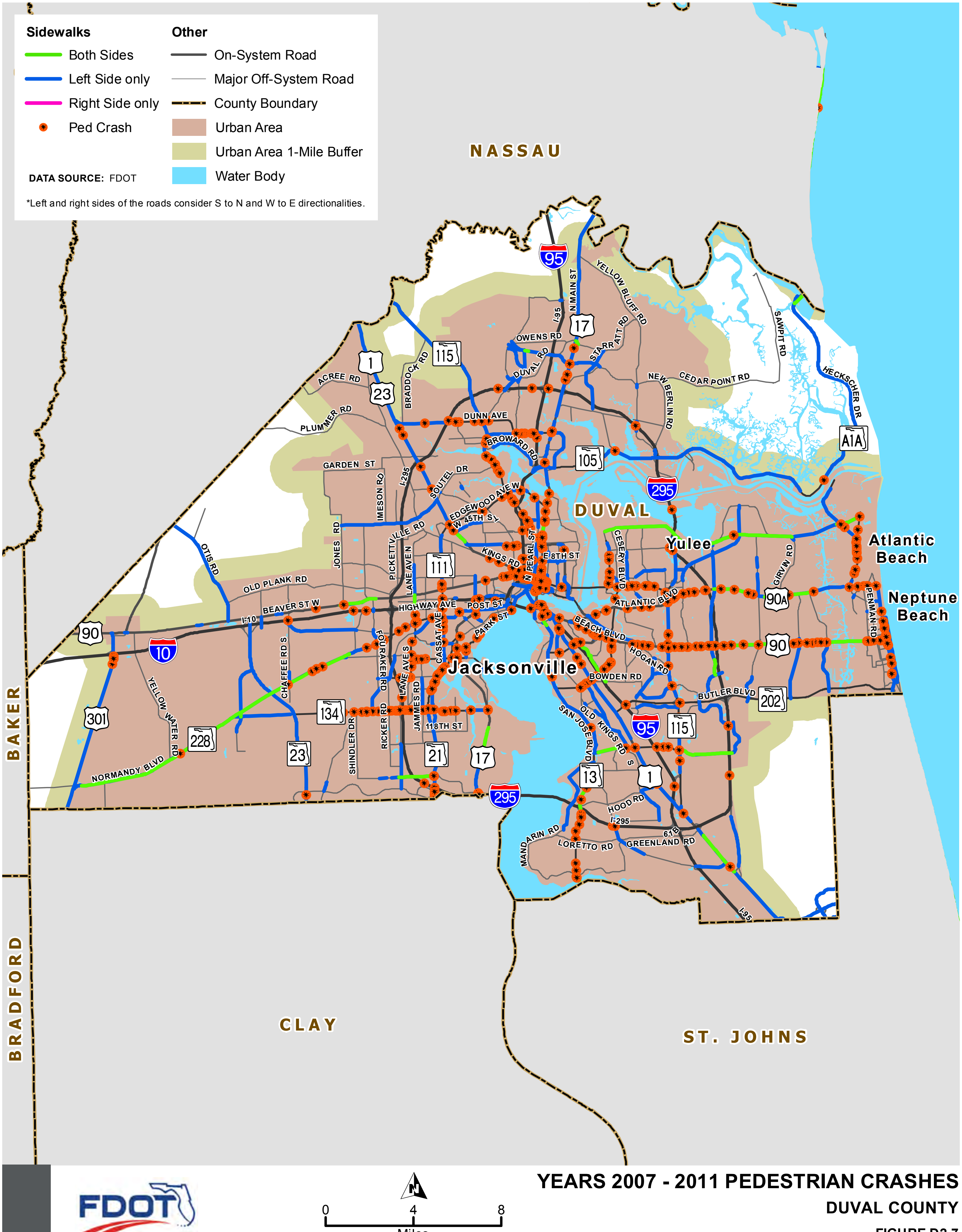
FIGURE D2-5




# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## DIXIE COUNTY

FIGURE D2-6

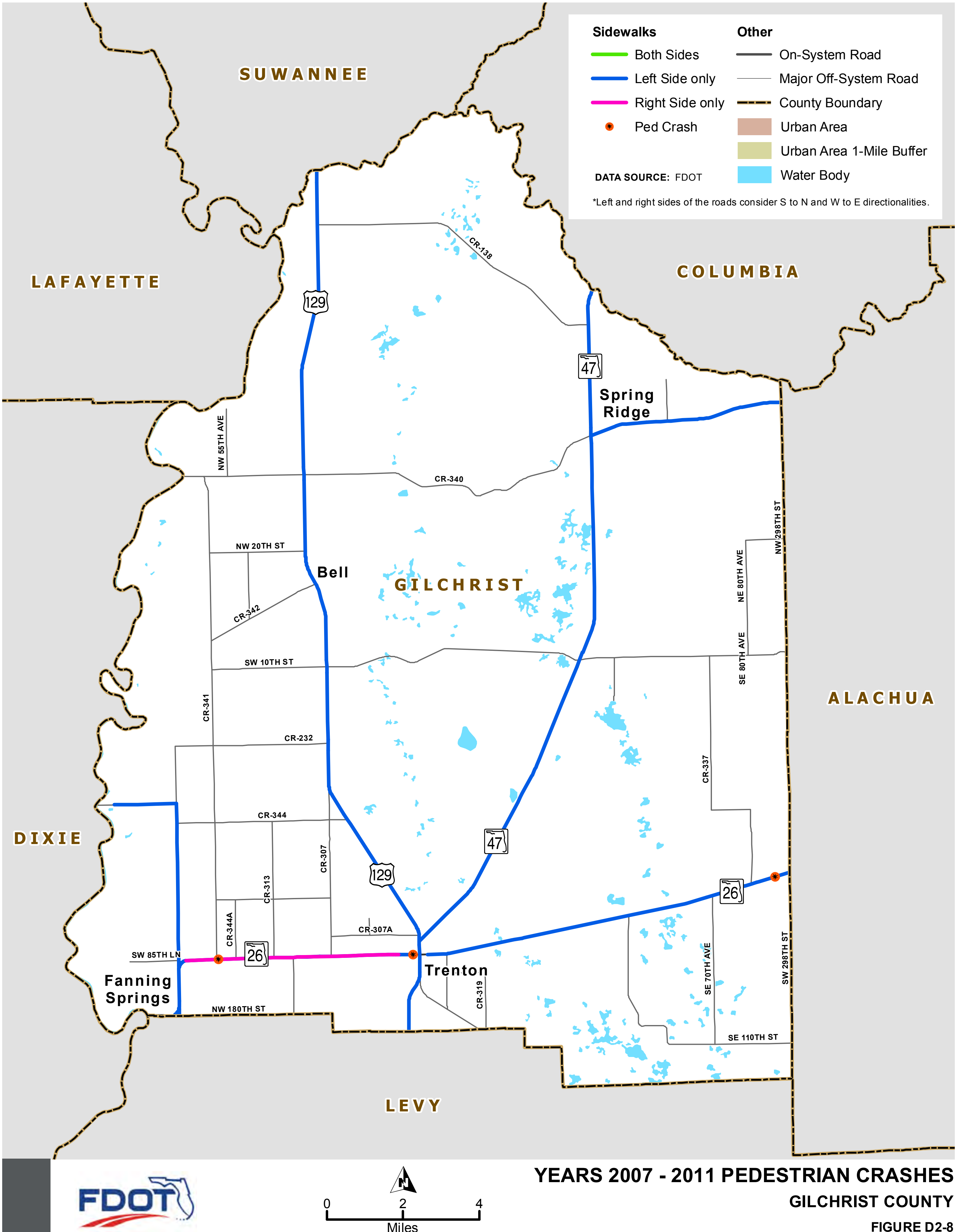



# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## DUVAL COUNTY

FIGURE D2-7

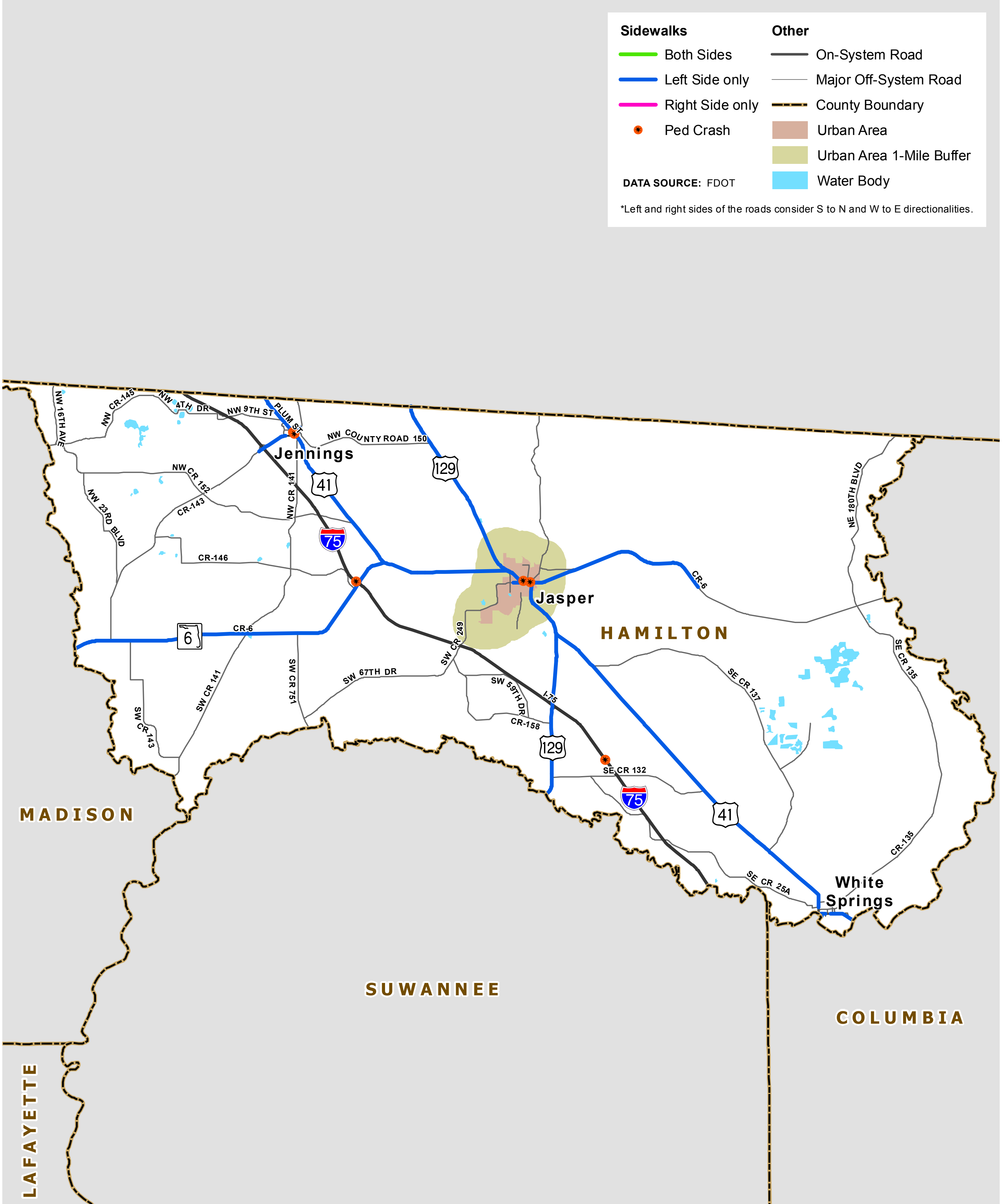
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## GILCHRIST COUNTY

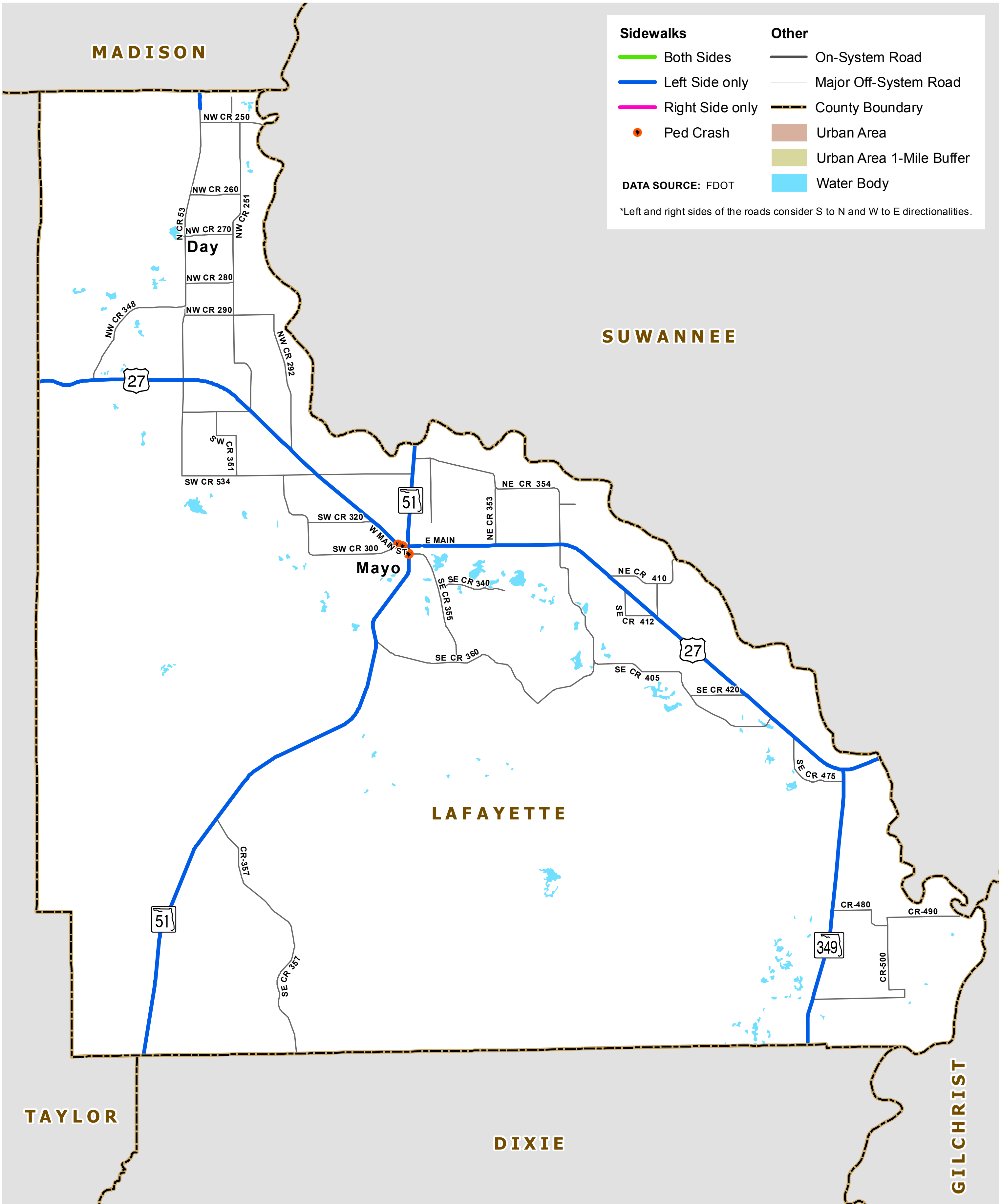
FIGURE D2-8




## YEARS 2007 - 2011 PEDESTRIAN CRASHES

### HAMILTON COUNTY

**FIGURE D2-9**

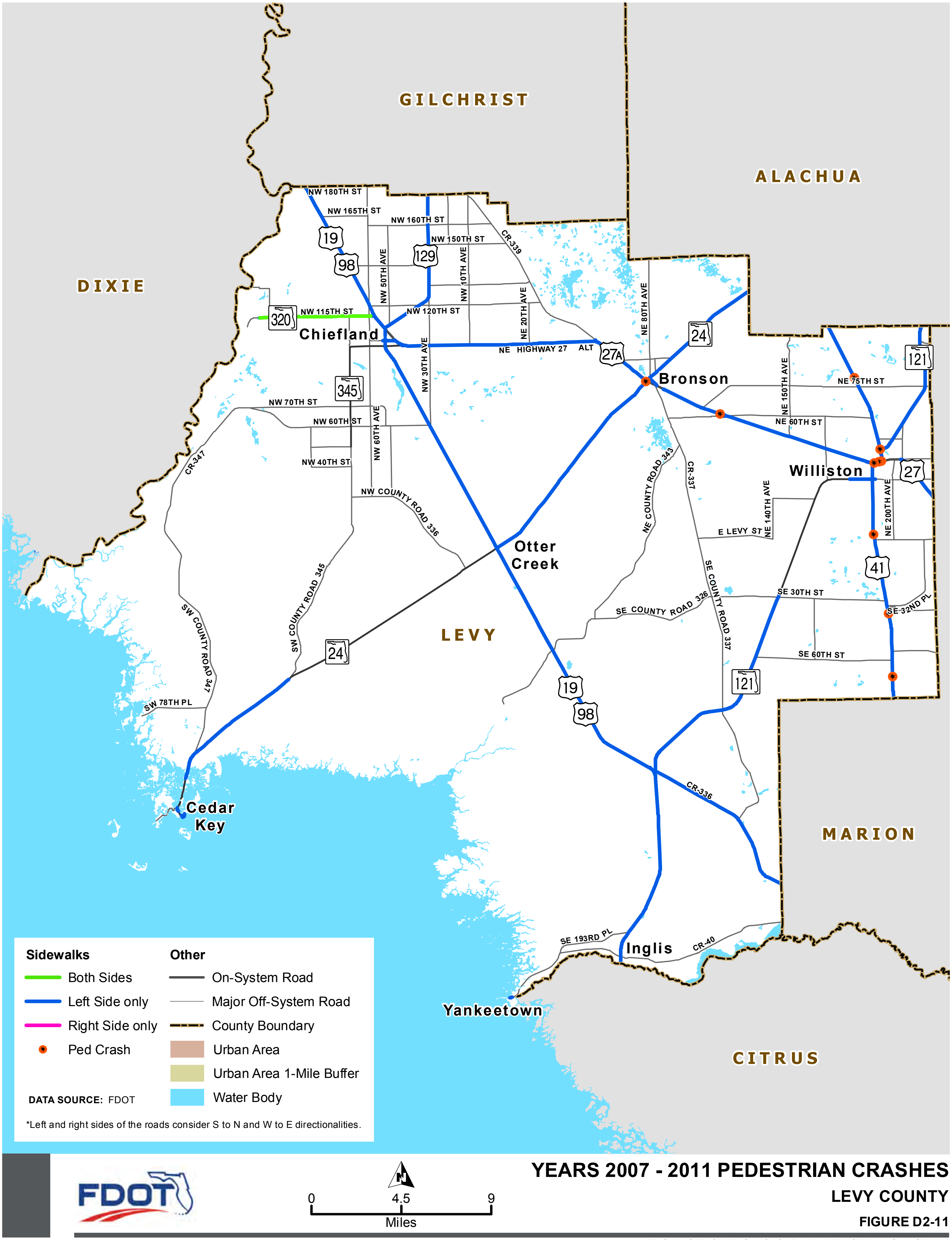



FDOT

# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## LAFAYETTE COUNTY

FIGURE D2-10

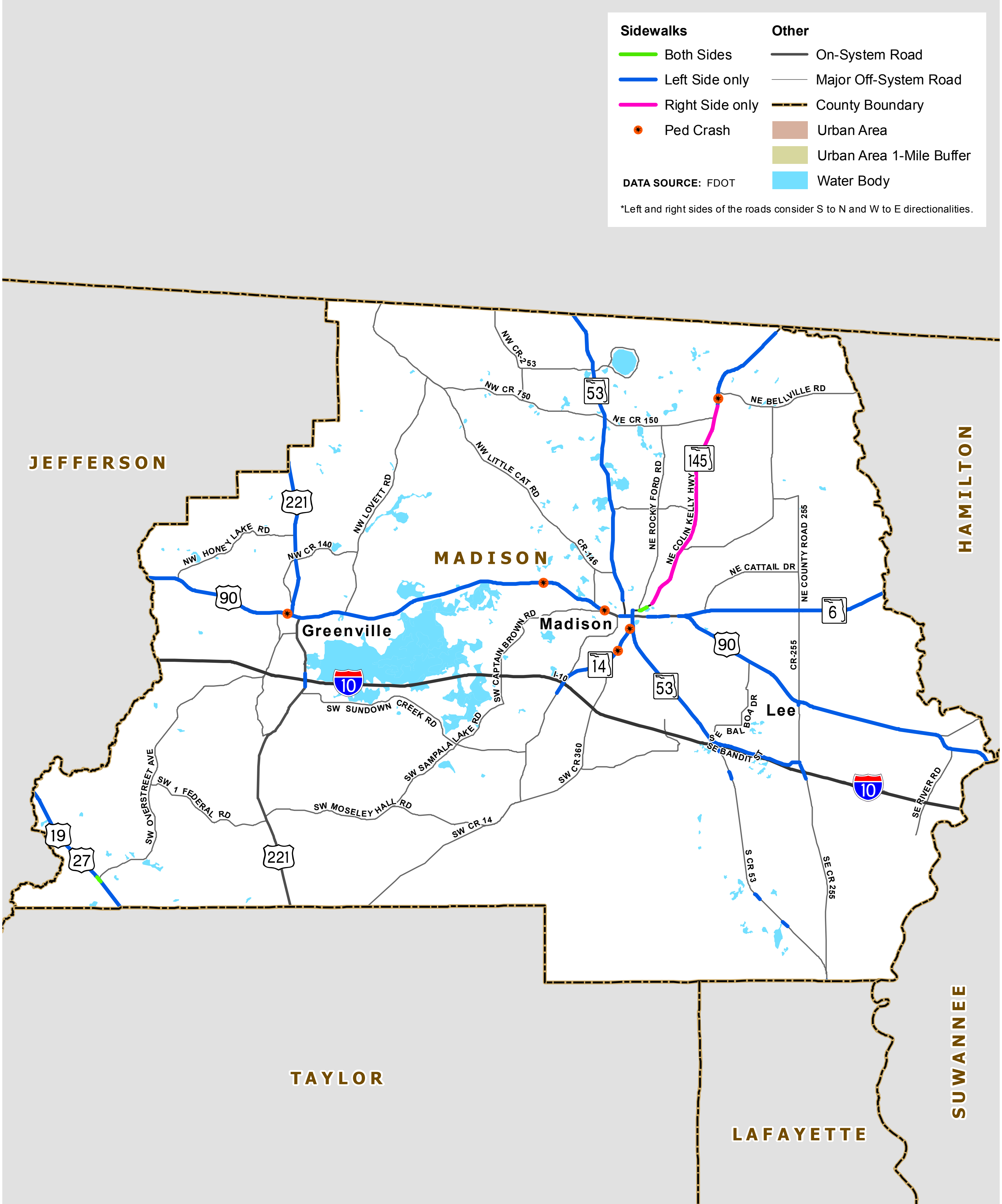



FDOT

# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## LEVY COUNTY

FIGURE D2-11

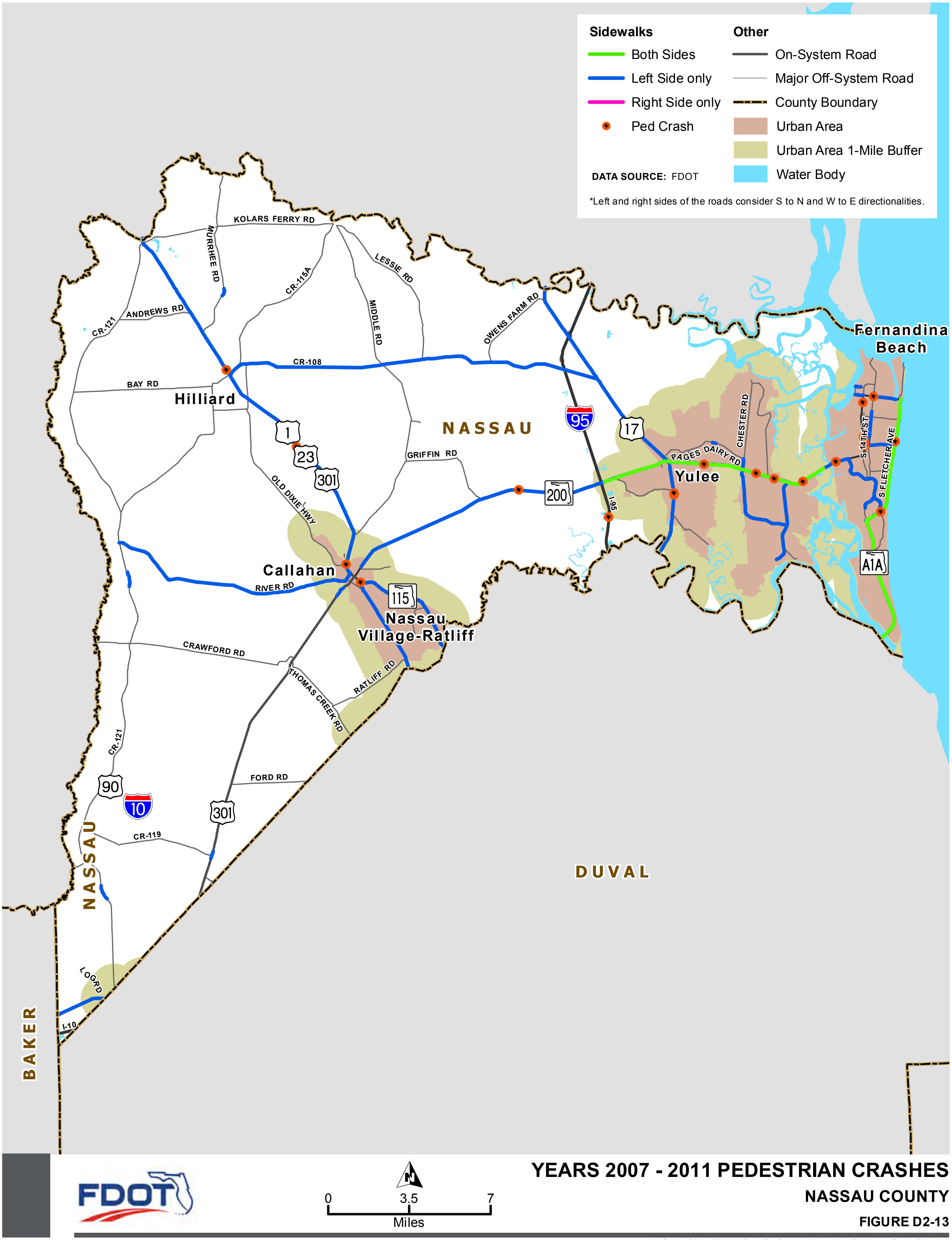



0 3.5 7
Miles

# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## MADISON COUNTY

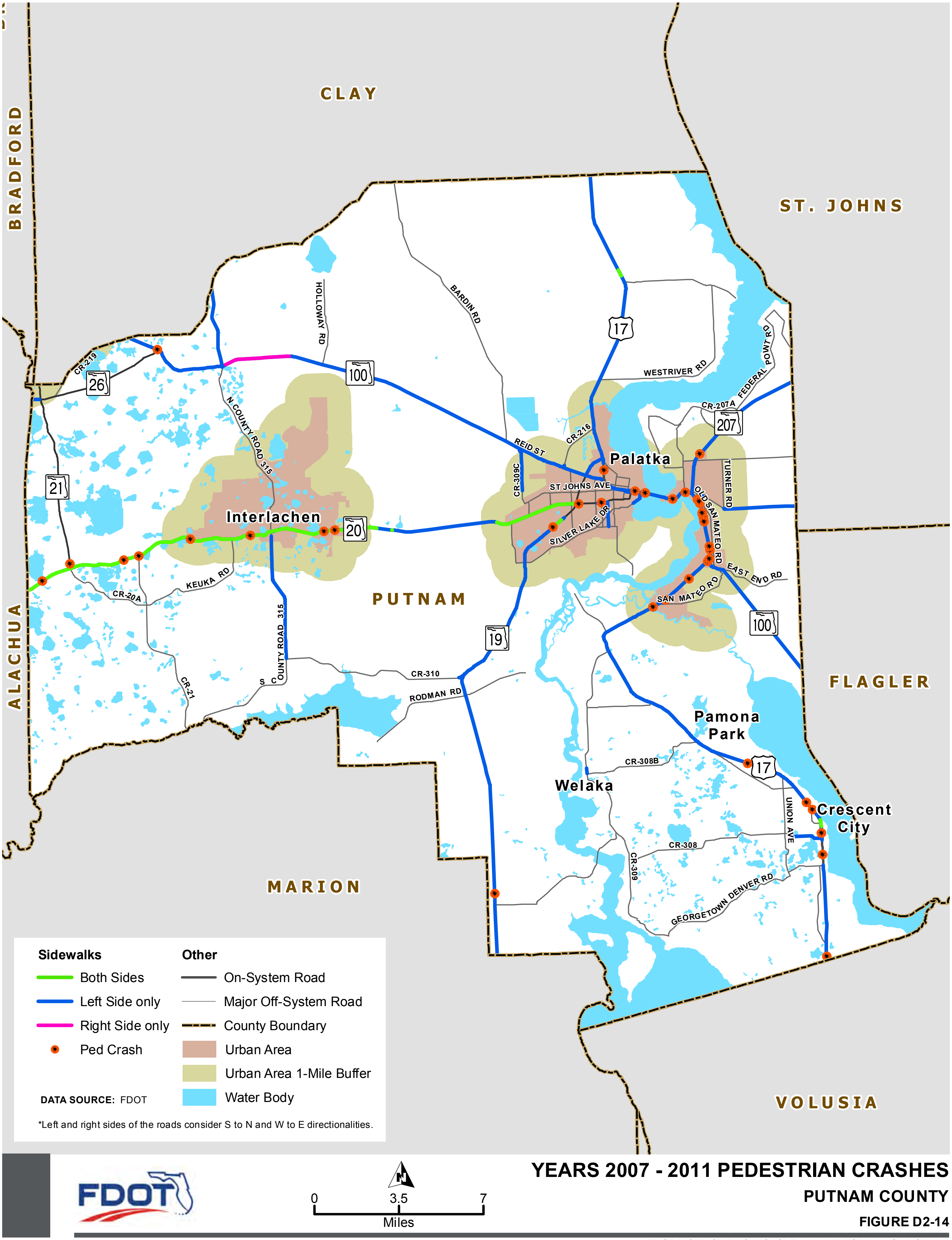
**FIGURE D2-12**




# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## NASSAU COUNTY

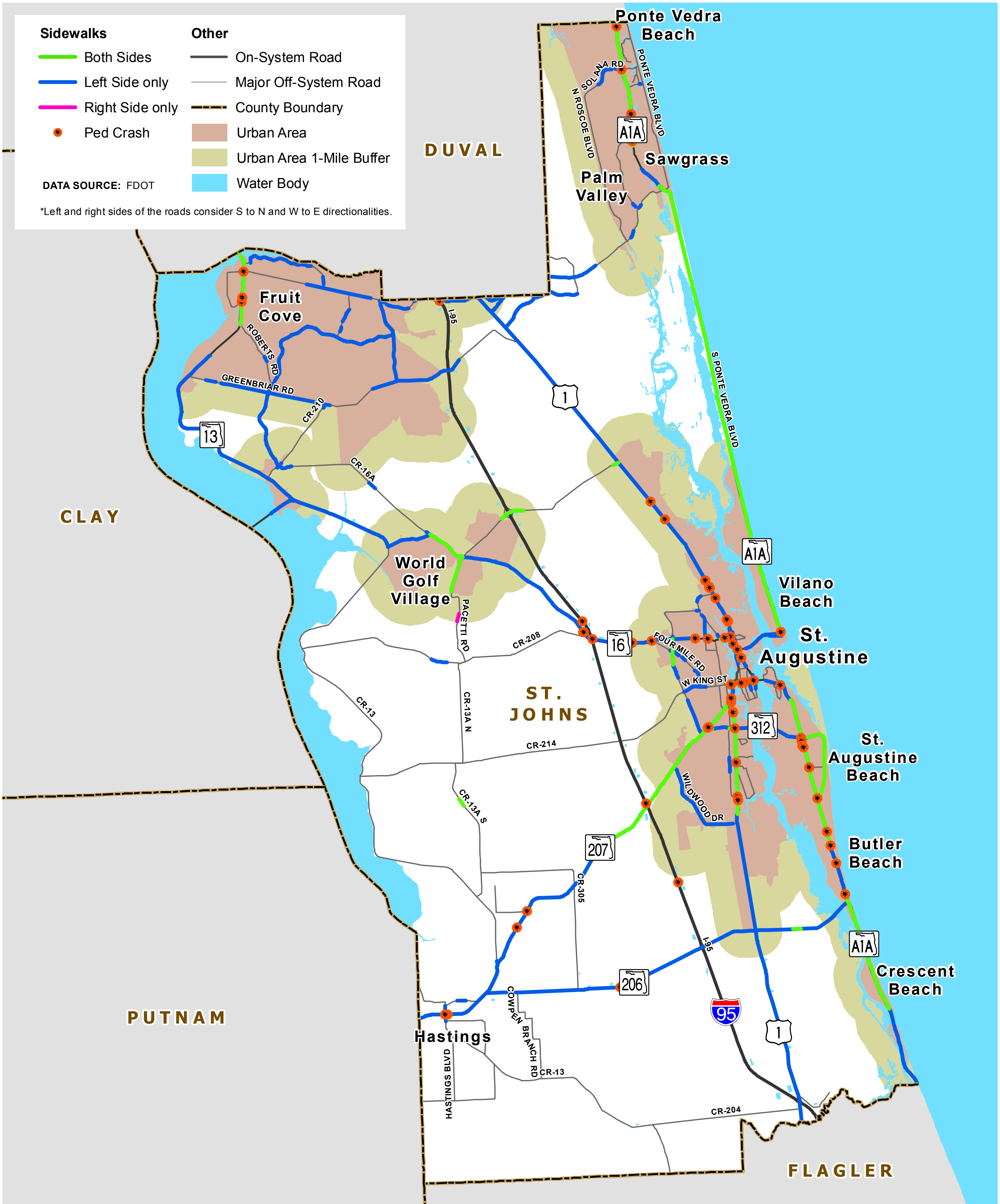
FIGURE D2-13




# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## PUTNAM COUNTY

FIGURE D2-14



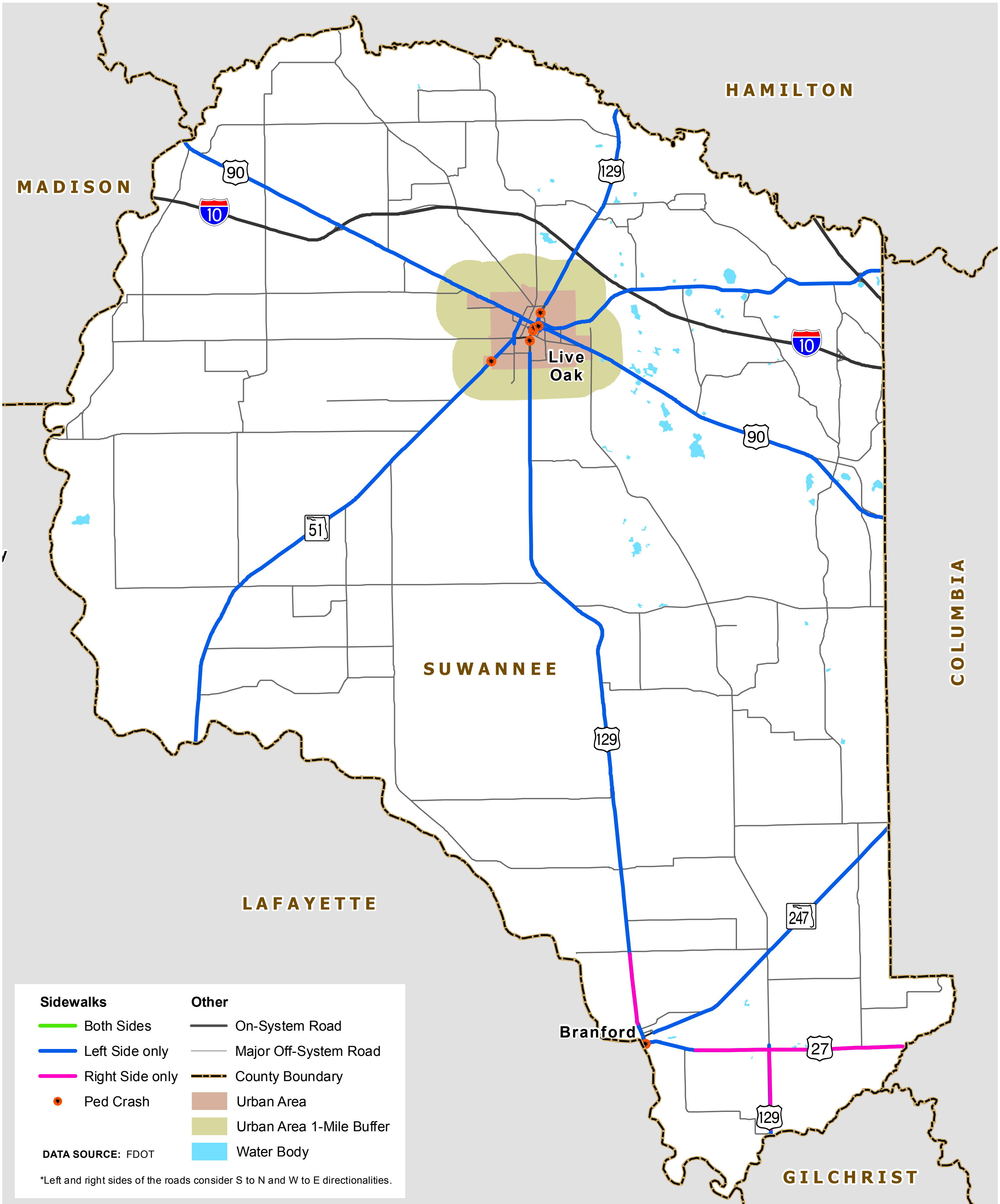

FDOT

0 3.5 7
Miles

# YEARS 2007 - 2011 PEDESTRIAN CRASHES

## ST. JOHNS COUNTY

**FIGURE D2-15**

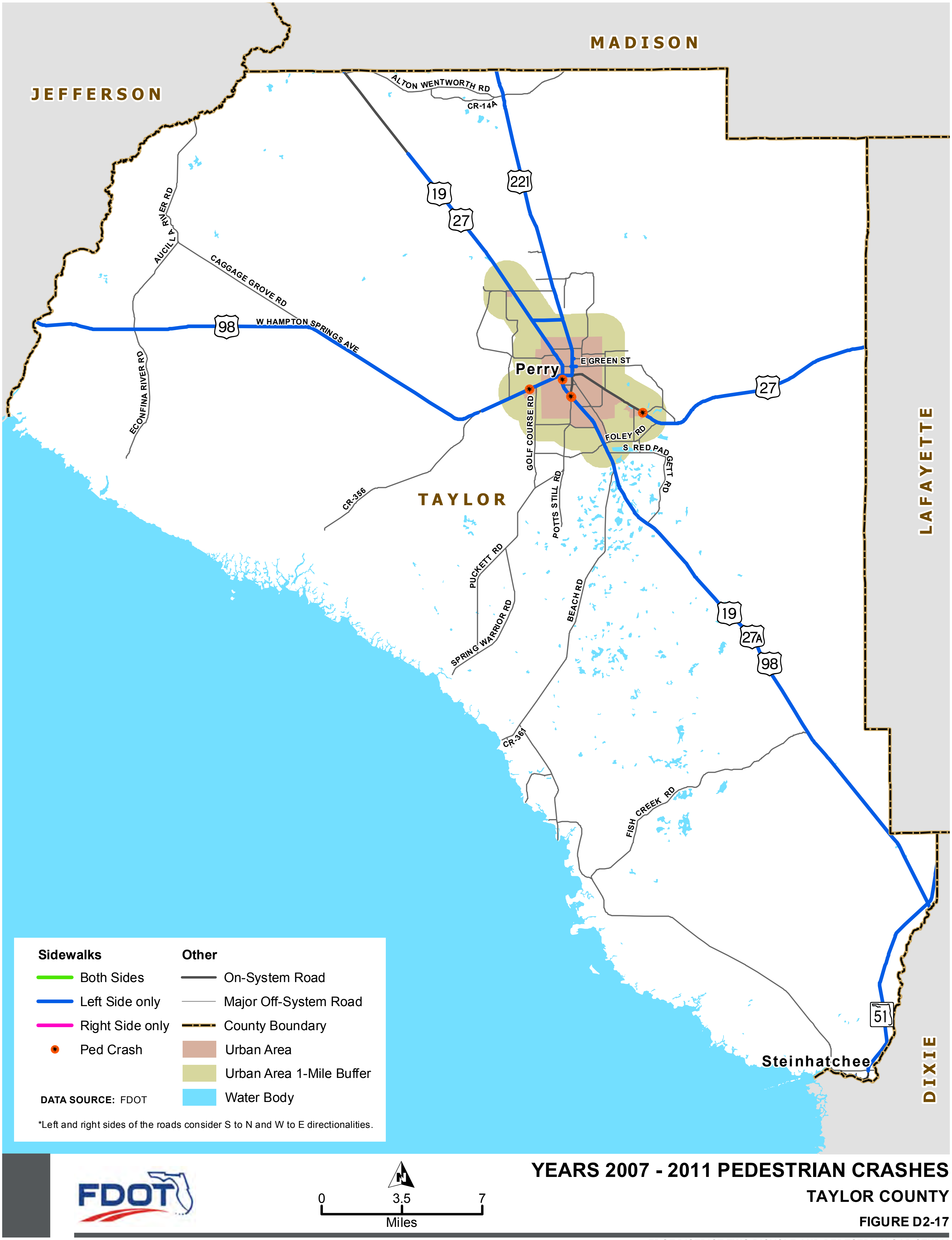



FDOT

**YEARS 2007 - 2011 PEDESTRIAN CRASHES**

**SUWANNEE COUNTY**

**FIGURE D2-16**

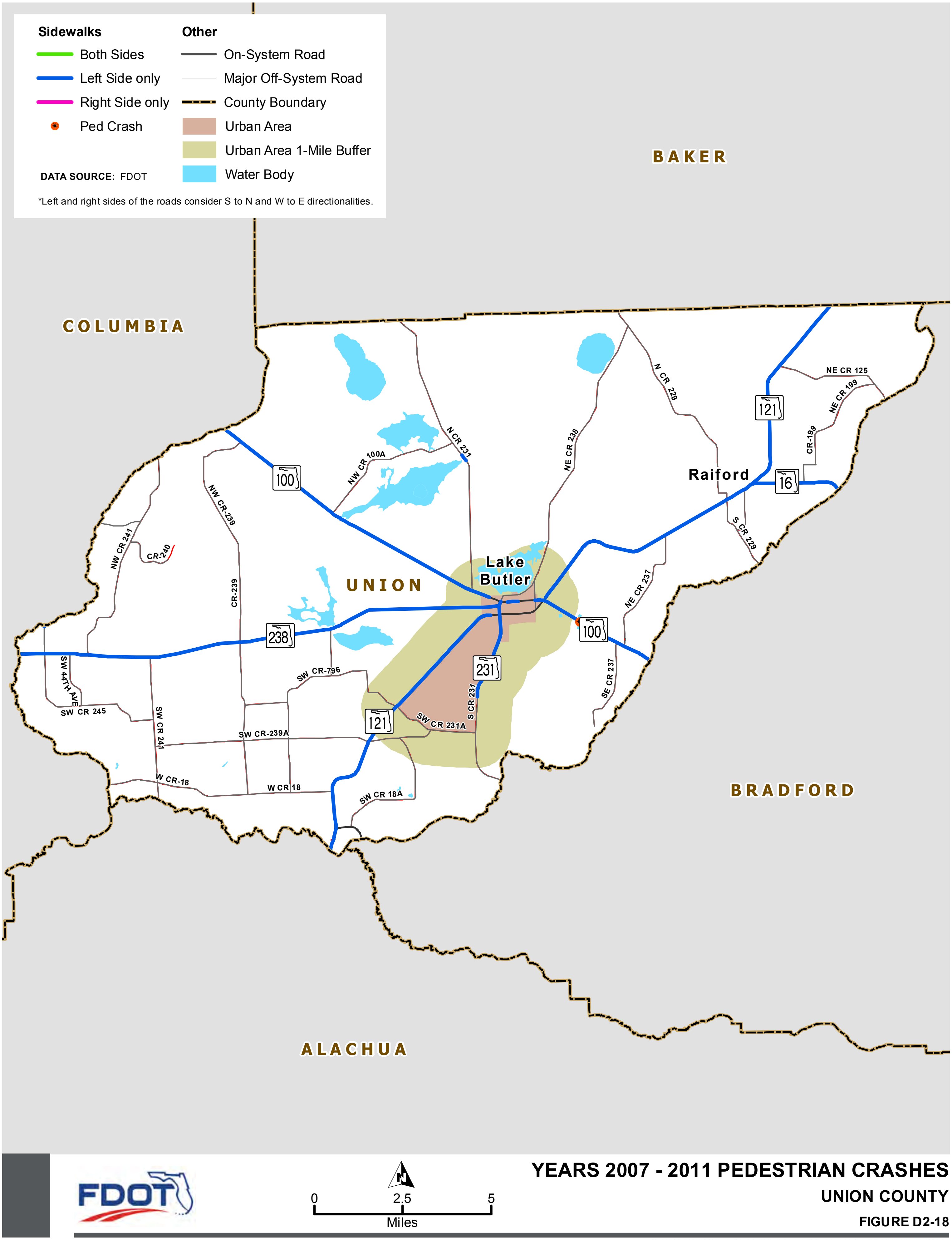



FDOT

# YEARS 2007 - 2011 PEDESTRIAN CRASHES

TAYLOR COUNTY

FIGURE D2-17

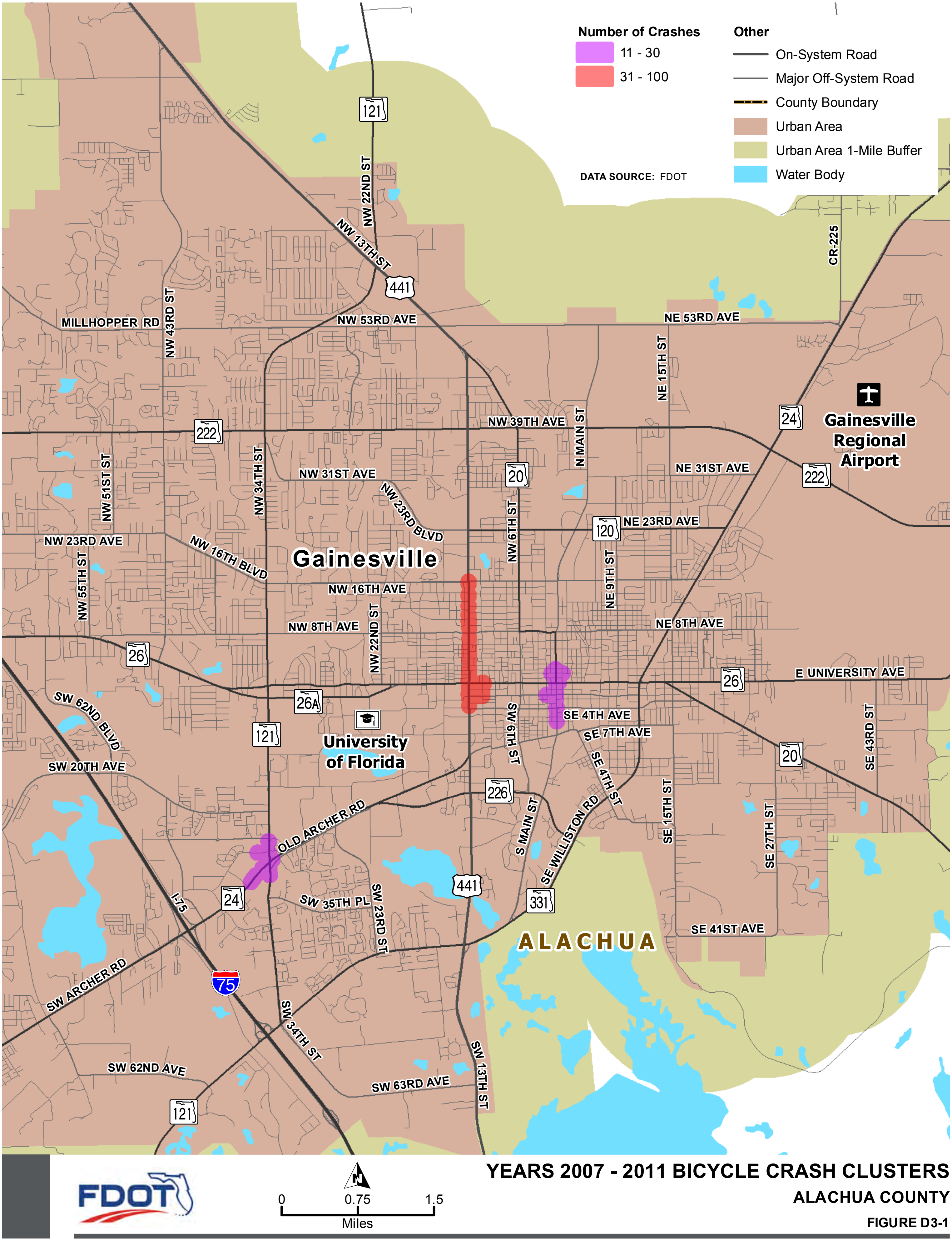



## YEARS 2007 - 2011 PEDESTRIAN CRASHES

### UNION COUNTY

FIGURE D2-18

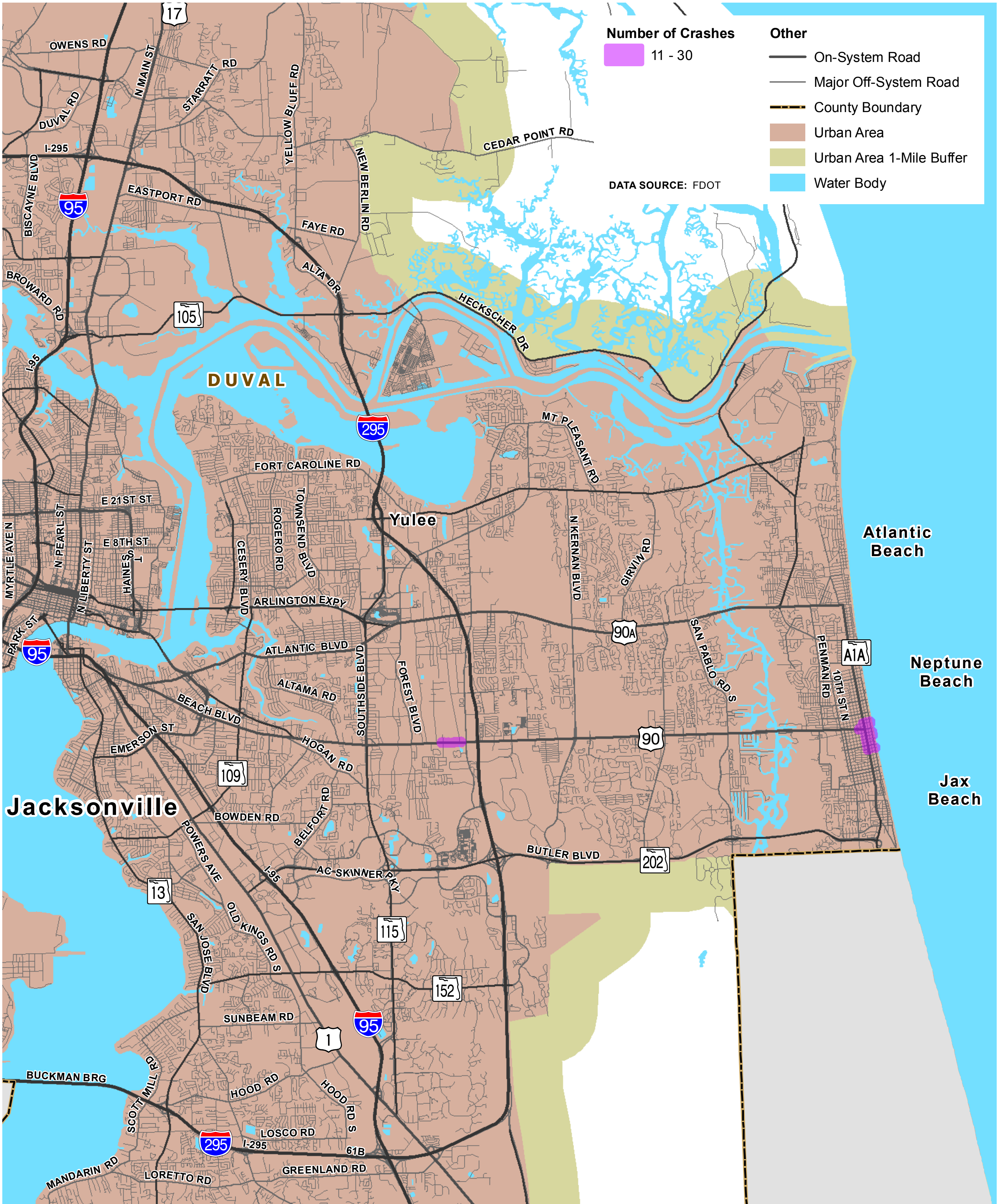
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




## YEARS 2007 - 2011 BICYCLE CRASH CLUSTERS

ALACHUA COUNTY

FIGURE D3-1

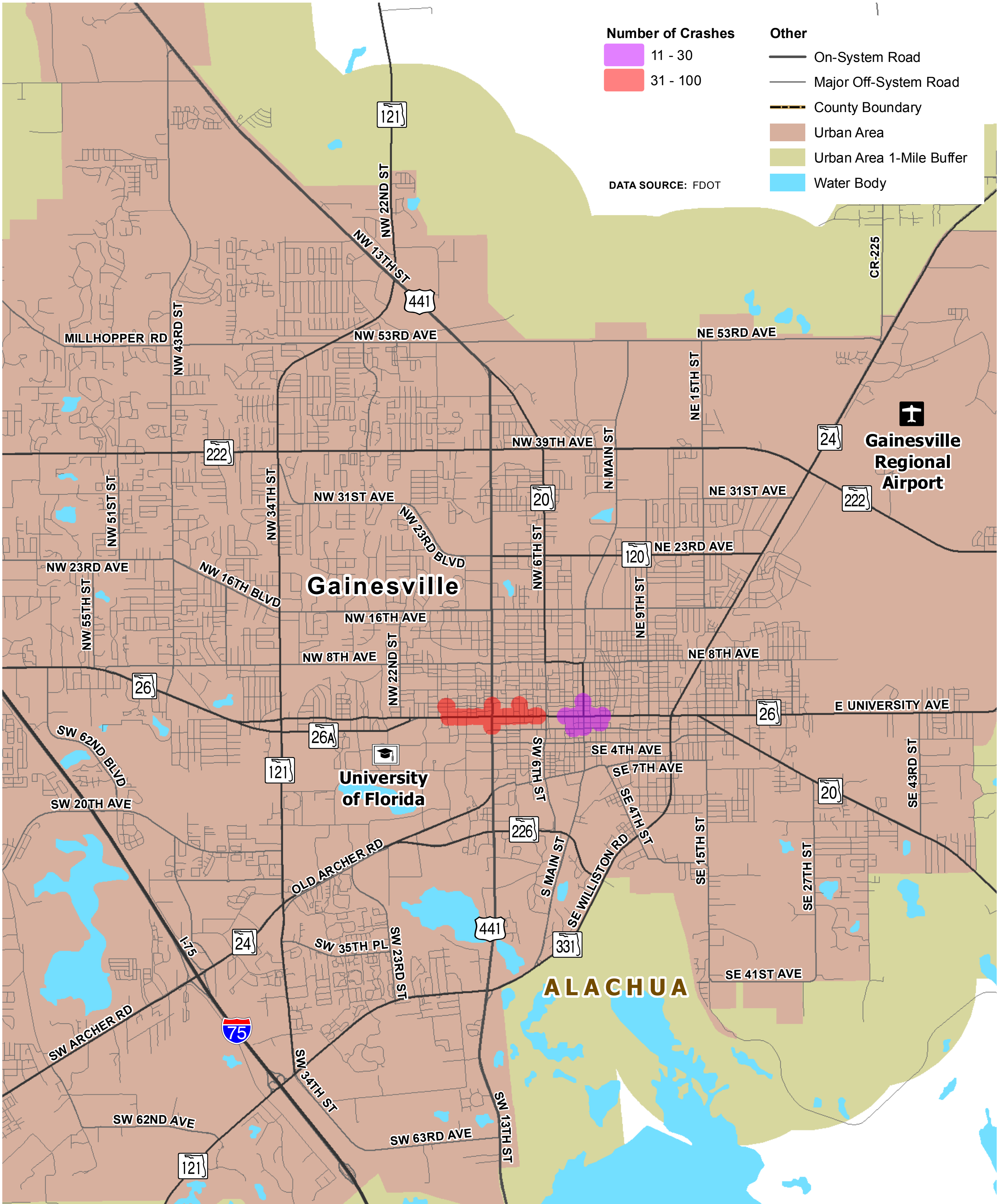



0 1.5 3
Miles

# YEARS 2007 - 2011 BICYCLE CRASH CLUSTERS

## DUVAL COUNTY

FIGURE D3-7



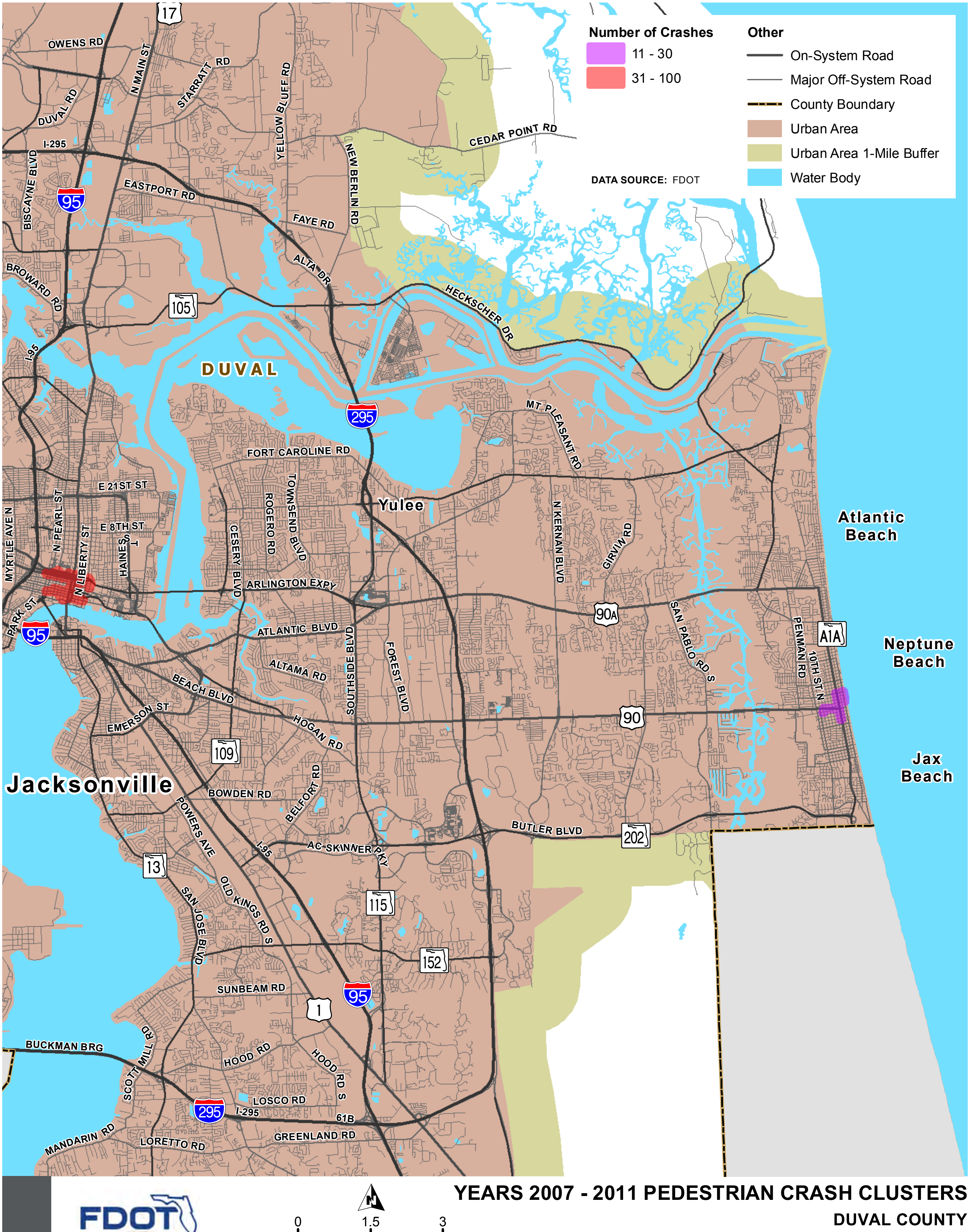

# YEARS 2007 - 2011 PEDESTRIAN CRASH CLUSTERS

## ALACHUA COUNTY

FIGURE D4-1

0 0.75 1.5
Miles

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# YEARS 2007 - 2011 PEDESTRIAN CRASH CLUSTERS

## DUVAL COUNTY

FIGURE D4-7

# 07

# Gap Prioritization

# 7.0 Gap Prioritization

The gap prioritization combines the information provided and collected in the previous sections to identify roadways in the District for gaps in the bicycle and pedestrian modes, and prioritizes the gaps for future improvement.

## 7.1 Prioritization Protocol

All identified gaps, defined as the absence of facilities as specified in Section Three, will be part of the Study's prioritization process. As specified in the Scope of Services, the three primary elements of the prioritization protocol are existing bicycling and walking conditions (i.e., level of service), non-motorized demand (2010 base year results), and bicycle and pedestrian safety.[6] The results of the respective analyses affirm the appropriateness of their use for this purpose. Furthermore, these elements align well with the elements being used for a related Traffic Operations study being conducted for Duval County. One of that study's five elements is bicycle and pedestrian crash data, two more (Average Daily Traffic and posted speed limit) are key components of bicycle and pedestrian level of service, and the remaining two (pedestrian generators and auto ownership) are related to non-motorized demand.

Moreover, the gap prioritization analysis does not include projects funded or under construction, e.g., U.S. 301 between Baldwin and Callahan, that may alleviate existing gaps. The gap prioritization analysis only considers on-the-ground facilities. Specific gaps can be removed in future updates.

The recommended prioritization protocol for the Districtwide Bicycle and Pedestrian Gap Study consists of the following point-based scoring system:

**Existing Conditions/LOS**

- LOS F = 5 points
- LOS E = 4 points
- LOS D = 3 points
- LOS C = 2 points
- LOS B = 1 point
- LOS A = 0 points

**Potential Demand**

- highest quintile = 4 points
- second quintile = 3 points
- third quintile = 2 points
- fourth quintile = 1 point
- lowest quintile = 0 points

---

[6] The Scope also mentions identification in prior plans as a potential element. As discussed elsewhere, the only two adopted facility-based plans in the District are the North Florida TPO's and the Gainesville MTPO's. The recommendations of these plans will be carried forward by reference; therefore, that potential prioritization element is effectively incorporated.

**Crash Data**[7]

- 4 points if there was a fatal bicycle or pedestrian crash during the analysis period
- 4 points if pedestrian/bicycle crash density (per mile) is greater than or equal to five
- 3 points if pedestrian/bicycle crash density (per mile) is greater than or equal to three and less than five
- 1 point if pedestrian/bicycle crash density (per mile) is greater than or equal to one and less than three
- 0 points if pedestrian/bicycle crash density (per mile) is less than one

## 7.2 Bicycle Gap Methodology

Bicycle facility gaps are road segments that do not include a bike lane, bike slot (slot between a through and right turn lane), shared use path, or paved shoulder at least four feet wide in the FDOT Roadway Characteristics Inventory (RCI) database dated September 2014 and December 2014. Once the gaps are identified, each gap segment is prioritized based on the following criteria:

- Level of service
- Current and future potential demand
- Crash and safety analysis

The level of service segmentation, being very detailed, yielded many discrete gap segments some of which were too short and impractical for establishing Districtwide priorities. Consequently, contiguous gap segments were consolidated by calculating the distance-weighted average of the component segment priority scores. For example, if a roadway has two contiguous segments with one having a value of 1.6 and 5 miles long and another segment having a value of 3.2 and 10 miles long, then 2.7 would be the value of consolidated gap segment. This method yielded 407 consolidated prioritized bicycle facility gaps, which are grouped into 5 priority tiers, as listed in **Table 10**, and shown on **Figures E1-1** through **E1-18**.

**Table 7: Gap Prioritization Tier Determination**

| Tier | Numerical Range |
|---|---|
| 1 (highest priority) | ≥ 9.7 |
| 2 | >7.1 and ≤ 9.7 |
| 3 | >5.1 and ≤ 7.0 |
| 4 | >3.1 and ≤ 5.0 |
| 5 (lowest priority) | < 3.0 |

[7] These point values are taken directly from the parallel project; note, however, that the "one point" category has been expanded to include density values between two and three (this was presumed to be an unintended oversight in its original description).

## 7.3 Bicycle Gap Results

The bicycle gap prioritization determination values ranged from 1 (lowest) to 12 (highest). Tier 1 pedestrian gaps occur in Alachua, Clay, and Duval, Counties. In Alachua County, portions of Archer Road (S.R. 24), University Avenue (S.R. 26), and NW 13th Street/U.S. 441 (S.R. 25) have among the highest values for bicycle gap prioritization as shown on **Figure E1-1**. Duval County has the most bicycle gaps and the District's highest values (see **Figure E1-7** for details). The highest value of 12 occurs on 8th Street (S.R. 114) and McDuff Avenue (S.R. 129). Beach Boulevard (S.R. 212), University Boulevard (S.R. 109), Mayport Road (S.R. 101 and A1A), and San Jose Boulevard (S.R. 13) have very long contiguous segments. Blanding Boulevard (S.R. 21) in Clay County has a value of 12 (see **Figure E1-4**).

## 7.4 Pedestrian Gap Methodology

Pedestrian gaps are road segments without a sidewalk or a shared use path on either side of the road using the "Left/Right/Composite" field in the FDOT Roadway Characteristics Inventory (RCI) database dated September 2014 and December 2014. Once the gaps are identified, each gap segment is prioritized based the same evenly weighted criteria as for the bicycle gap.

Similar to the bicycle gaps, the level of service segmentation for the pedestrian gap prioritization, being very detailed, yielded many discrete gap segments some of which were too short and impractical for establishing Districtwide priorities. Consequently, contiguous gap segments were consolidated by calculating the distance-weighted average of the component segment priority scores. This method yielded 416 consolidated prioritized gaps, which are grouped into 5 priority tiers, as listed in **Table 11**, and shown on **Figures E2-1** through **E2-18**.

**Table 8: Gap Prioritization Tier Determination**

| Tier | Numerical Range |
|---|---|
| 1 (highest priority) | ≥ 8.1 |
| 2 | > 6.5 and ≤ 8.0 |
| 3 | > 5.2 and ≤ 6.4 |
| 4 | > 4.1 and ≤ 5.1 |
| 5 (lowest priority) | < 4.0 |

## 7.5 Pedestrian Gap Results

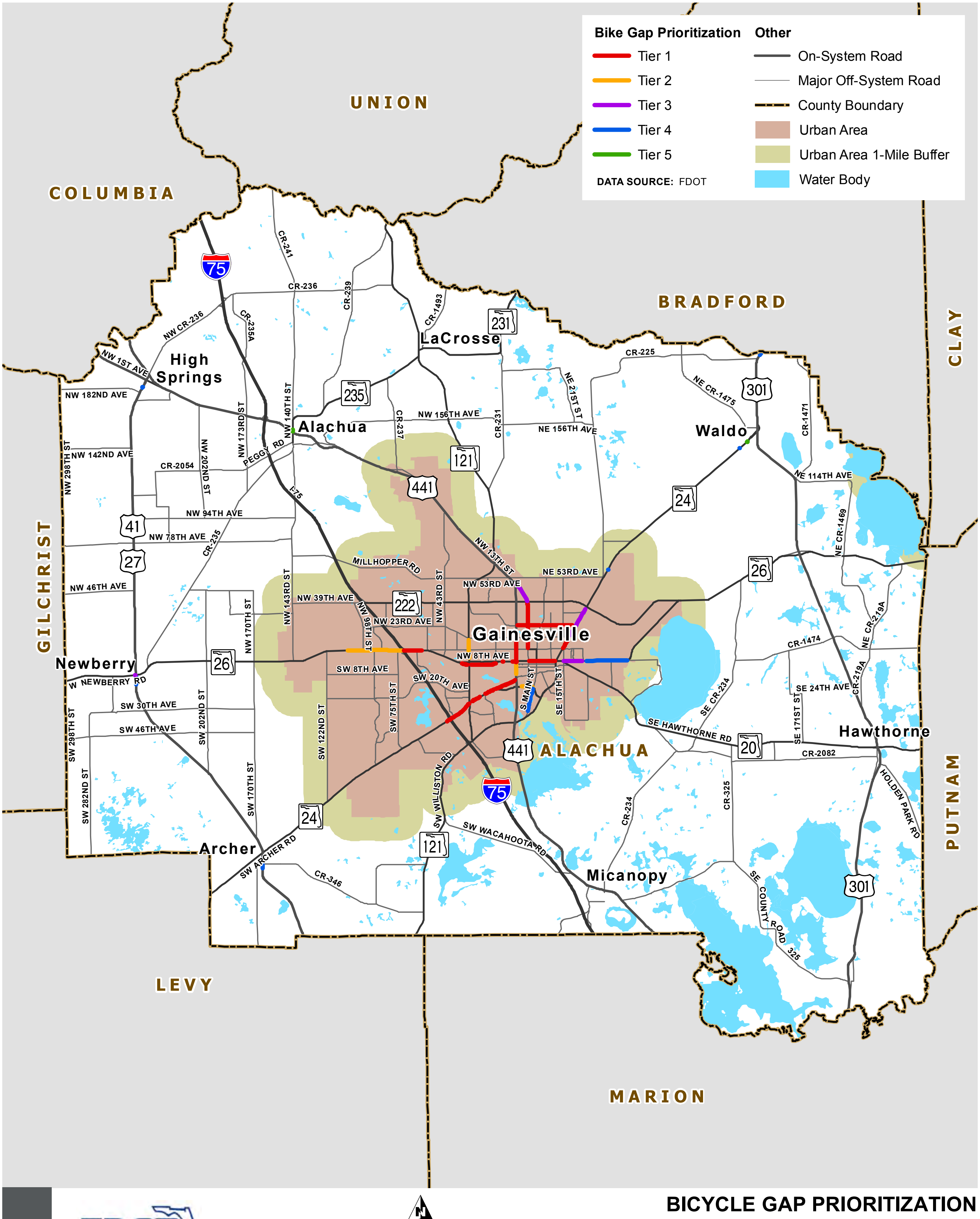
The pedestrian gap prioritization determination values ranged from 2 (lowest) to 13 (highest). Tier 1 pedestrian gaps occur in Alachua, Clay, Duval, and St. Johns Counties. In Alachua County, U.S. 441 (S.R. 20) and NW 23rd Avenue (S.R. 120) are the only state roads having values above 8.1 as shown on **Figure E2-1**. Not surprisingly, Duval County has the most pedestrian gaps and the District's highest values (see **Figure E2-7** for details). The highest value of 13 occurs on Beach Boulevard (S.R. 212) near the terminus at the Hart Expressway (S.R. 228). The Southside Boulevard (S.R. 115), Arlington Expressway (S.R. 10A), Hart Expressway (S.R. 228), Philips Highway/U.S. 1 (S.R. 5), 20th Street (S.R. 15), and MLK, Jr. Expressway

(S.R. 115) have very long contiguous segments which sometimes intersect. While Clay and St. Johns Counties do have contiguous segments, they are relatively short compared to those in Alachua and Duval Counties. Nevertheless, segments of U.S. 17 (S.R. 15) and Blanding Boulevard (S.R. 21) in Clay County have values of 9 and above (see **Figure E2-4**). Meanwhile, St. Johns County has segment of Ponce de Leon Boulevard/U.S. 1 (S.R. 5) with values of 8.8 and 10 as shown on **Figure E2-15**.

Tier 2 includes facilities in the same counties as tier 1, which is inclusive of Nassau, Putnam, and Columbia Counties. S.R. A1A in Nassau County, U.S. 17 (S.R. 15) and S.R. 20 in Putnam County, and Main Boulevard/U.S. 41 (S.R. 45) in Columbia County all have noticeably long tier 2 contiguous segments.

## 7.6 Application of Results

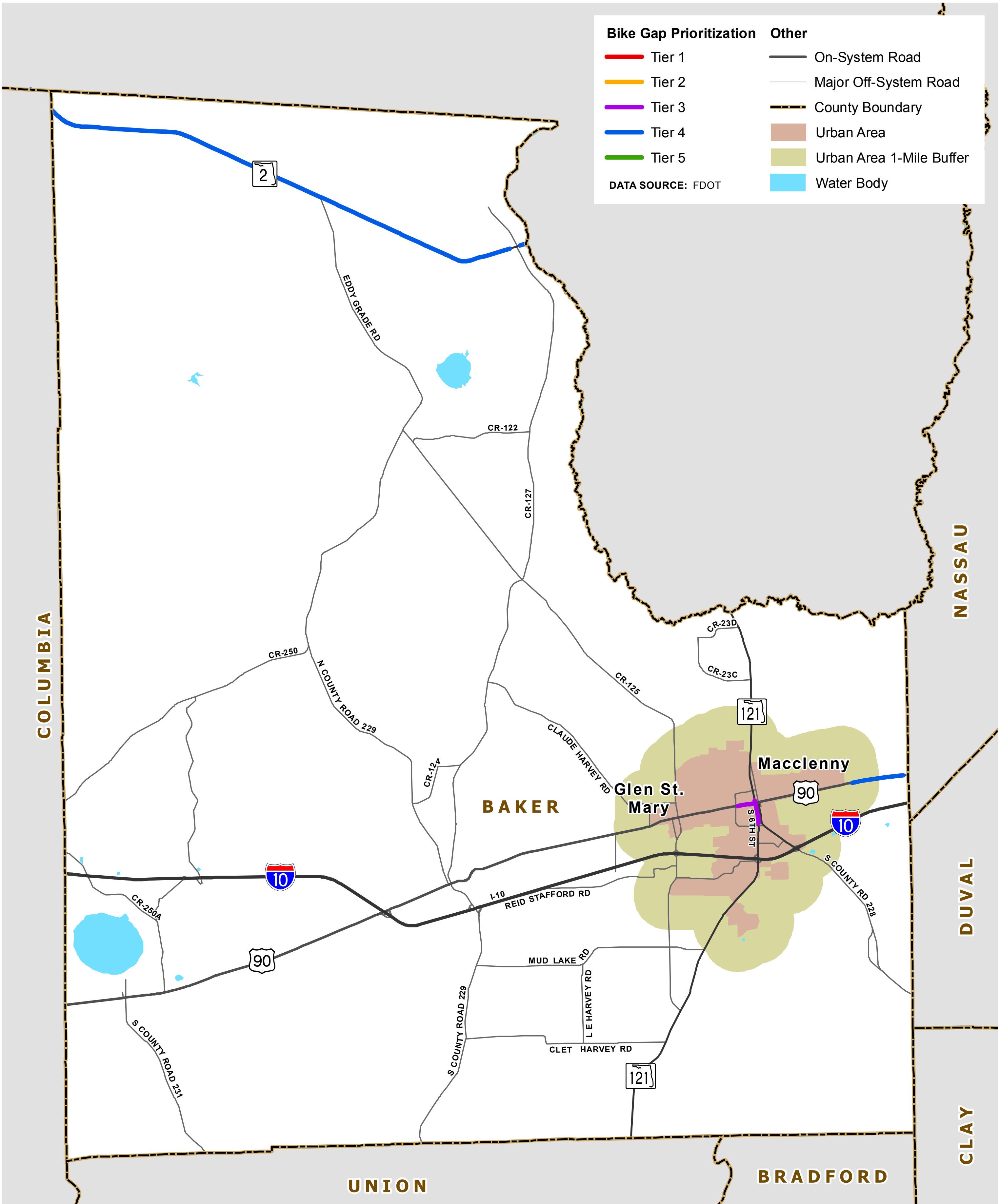
The results of this prioritization process will serve as a guide to the District as it seeks to improve bicycle and pedestrian accommodations over time. While gradual expansion of the non-motorized facility networks will be accomplished through a variety of funding sources and project types, these findings can provide an objective resource for future roadway planning.




# BICYCLE GAP PRIORITIZATION

## ALACHUA COUNTY

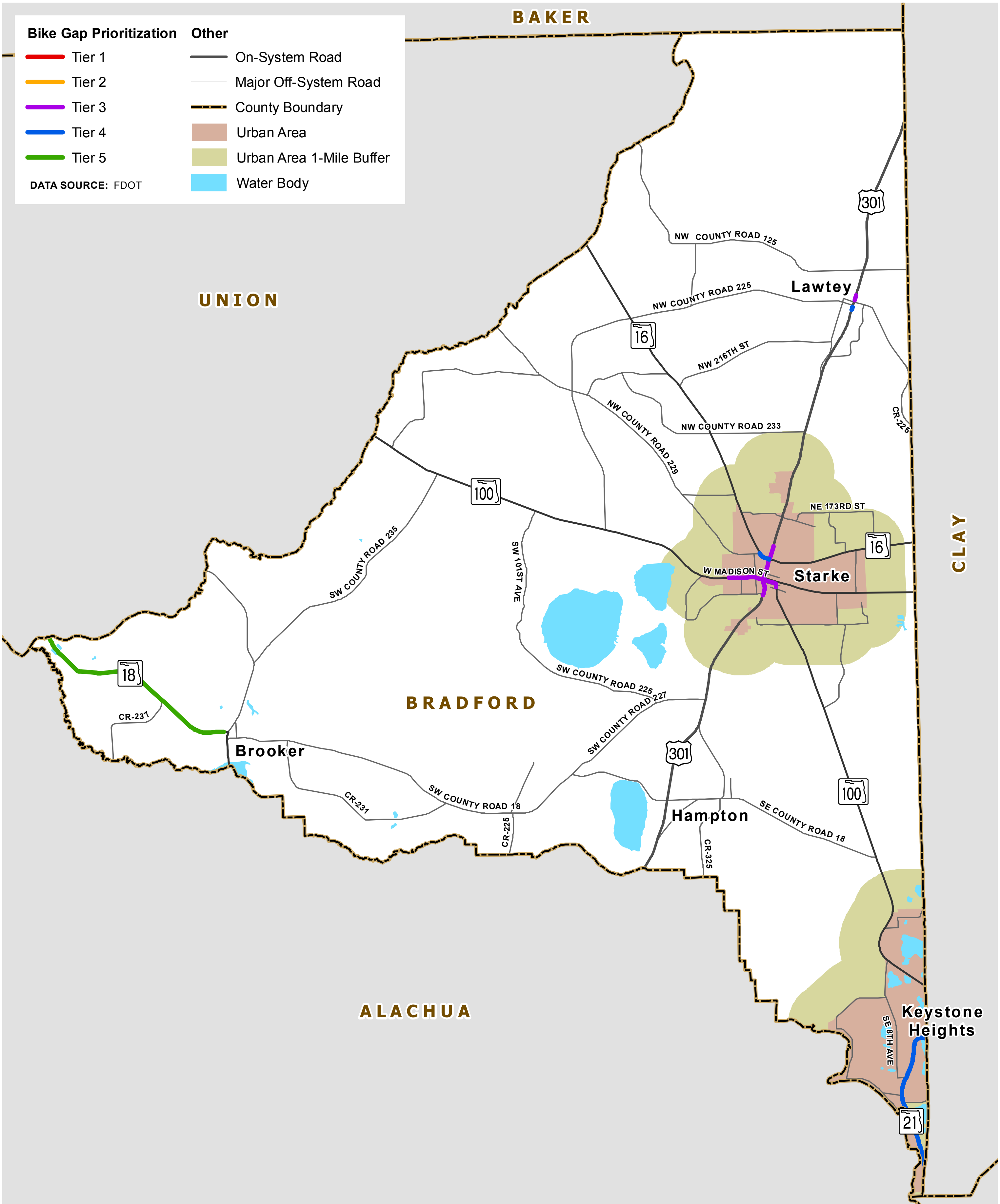
FIGURE E1-1




# BICYCLE GAP PRIORITIZATION

## BAKER COUNTY

FIGURE E1-2

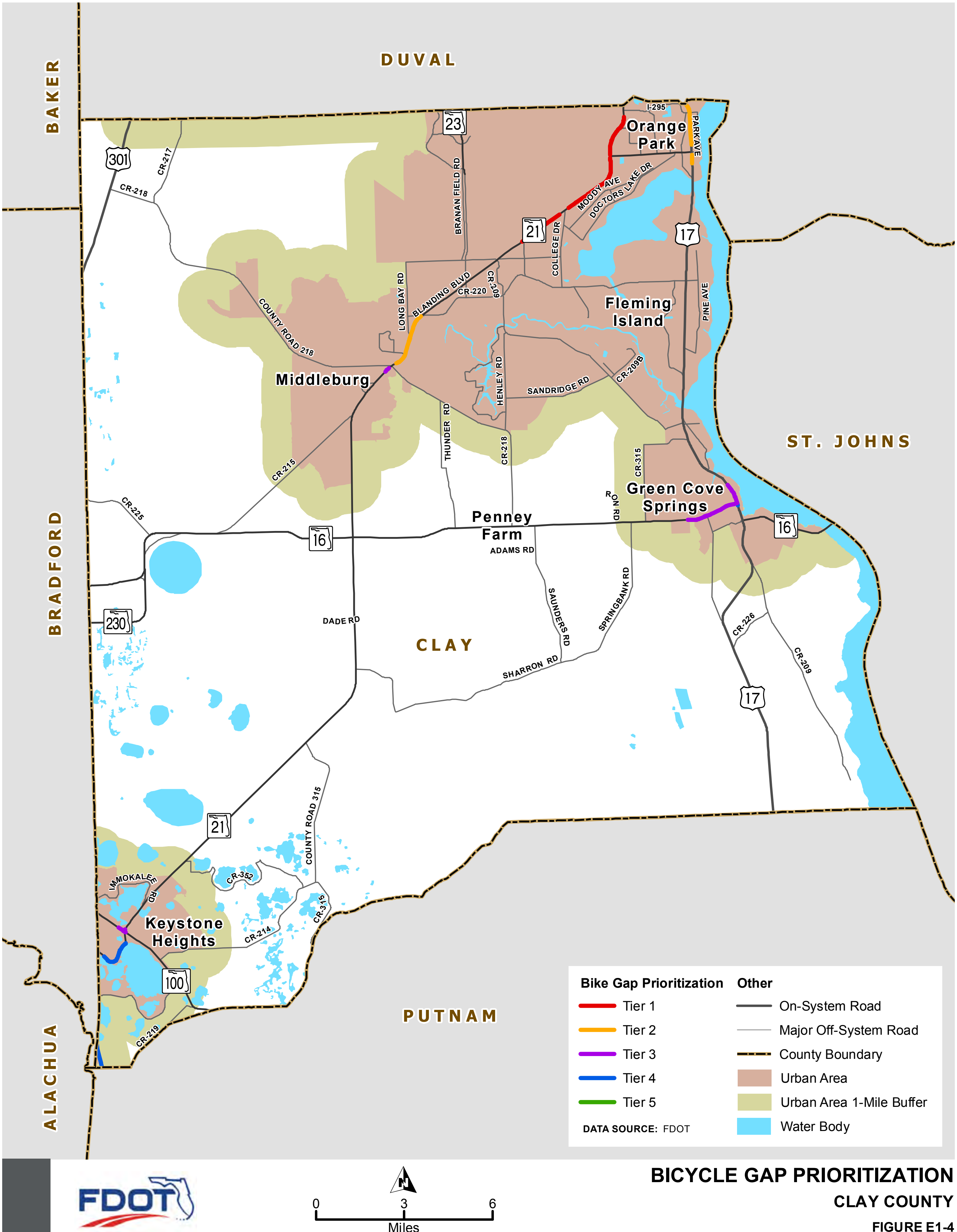



FDOT

# BICYCLE GAP PRIORITIZATION

## BRADFORD COUNTY

FIGURE E1-3

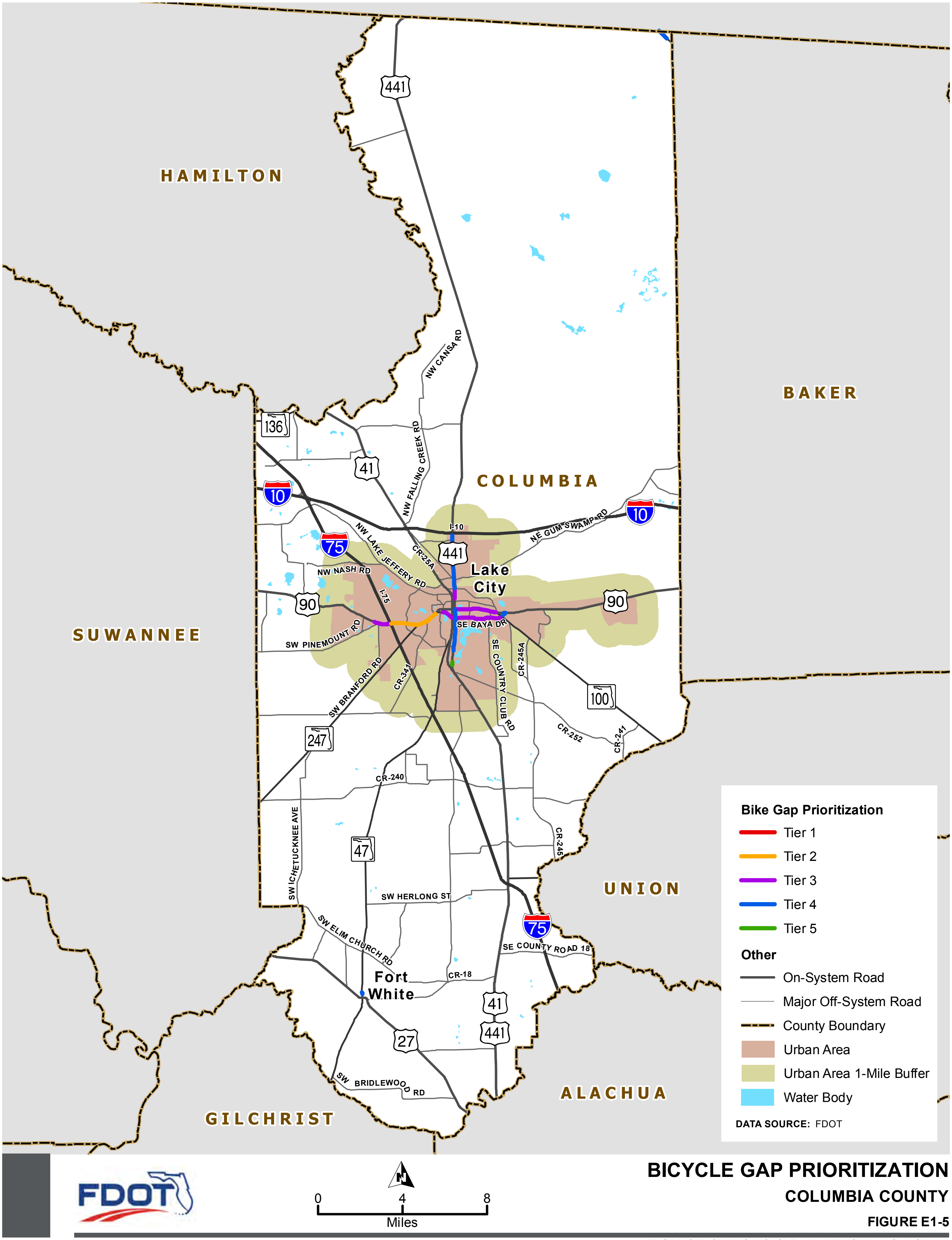



# BICYCLE GAP PRIORITIZATION

## CLAY COUNTY

FIGURE E1-4

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

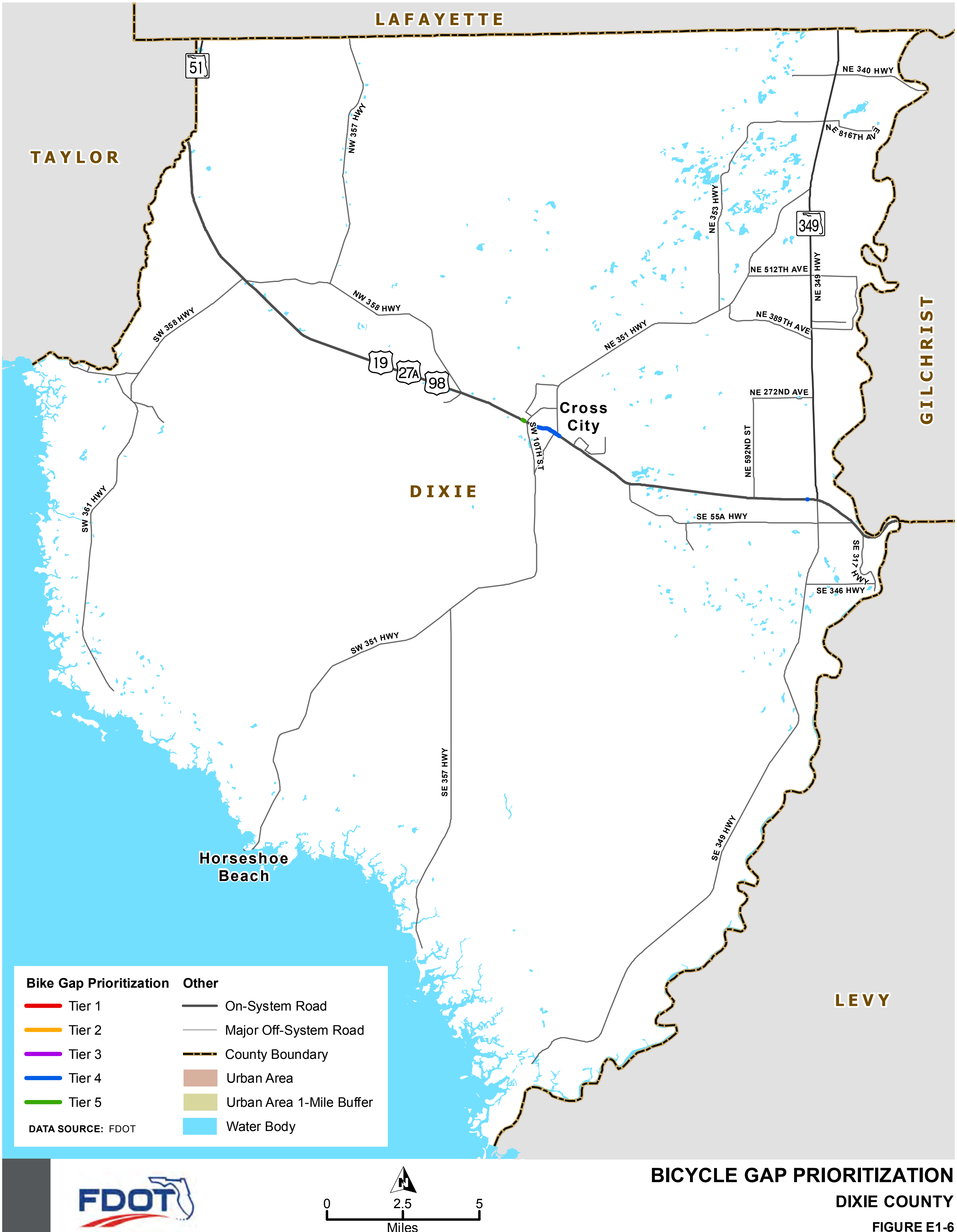



FDOT

# BICYCLE GAP PRIORITIZATION

## COLUMBIA COUNTY

FIGURE E1-5

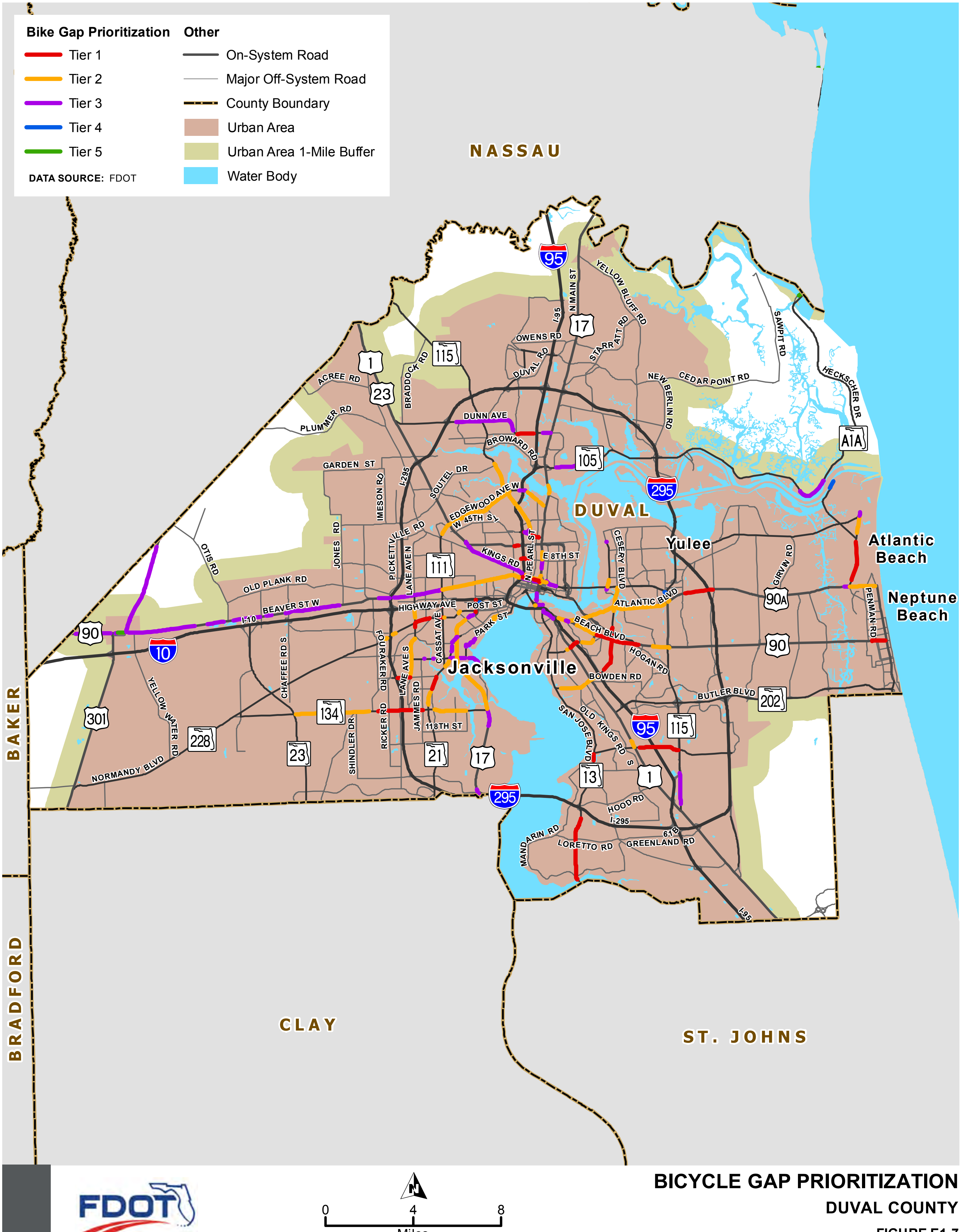



FDOT

# BICYCLE GAP PRIORITIZATION

## DIXIE COUNTY

**FIGURE E1-6**

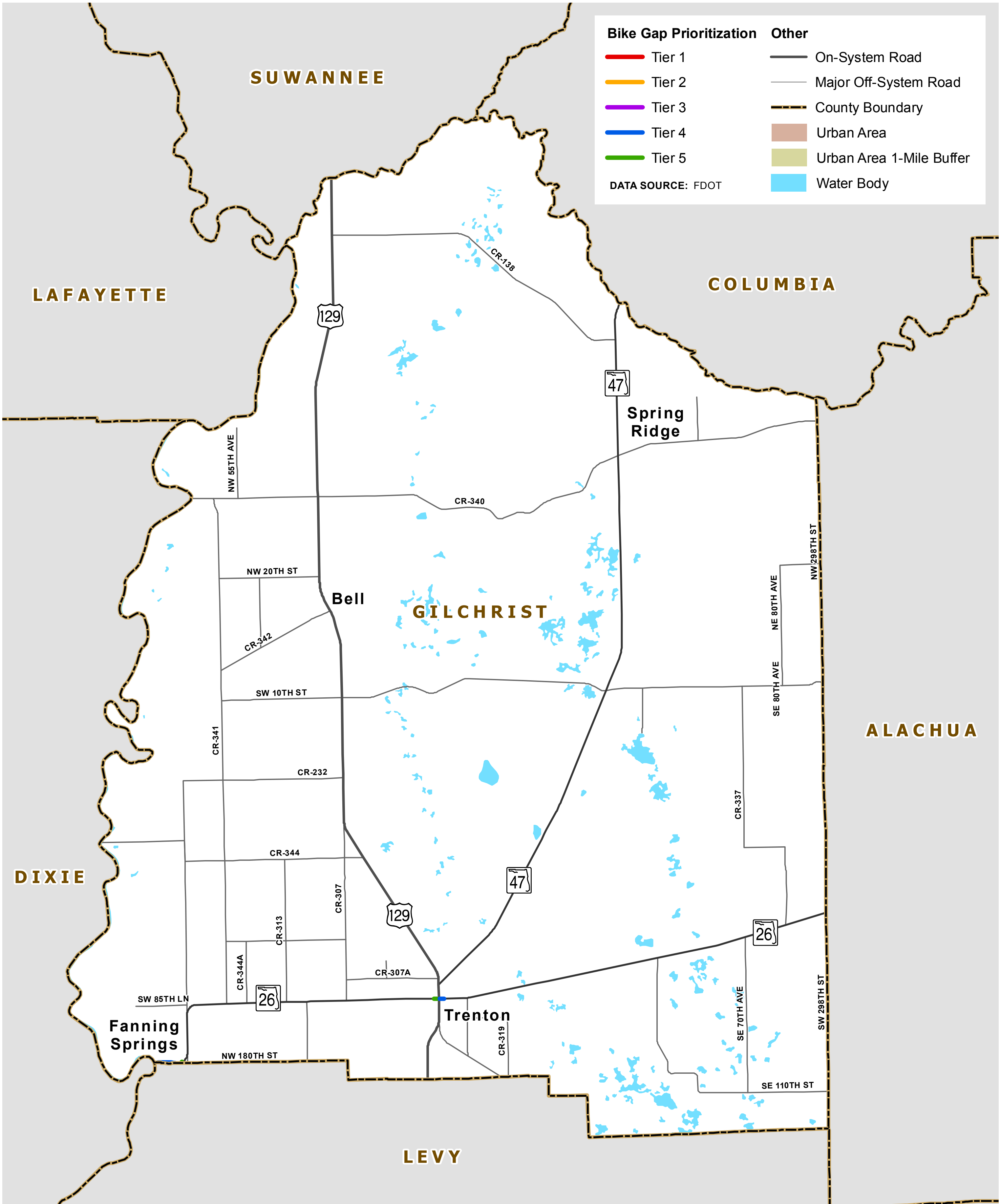



# BICYCLE GAP PRIORITIZATION

## DUVAL COUNTY

**FIGURE E1-7**

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

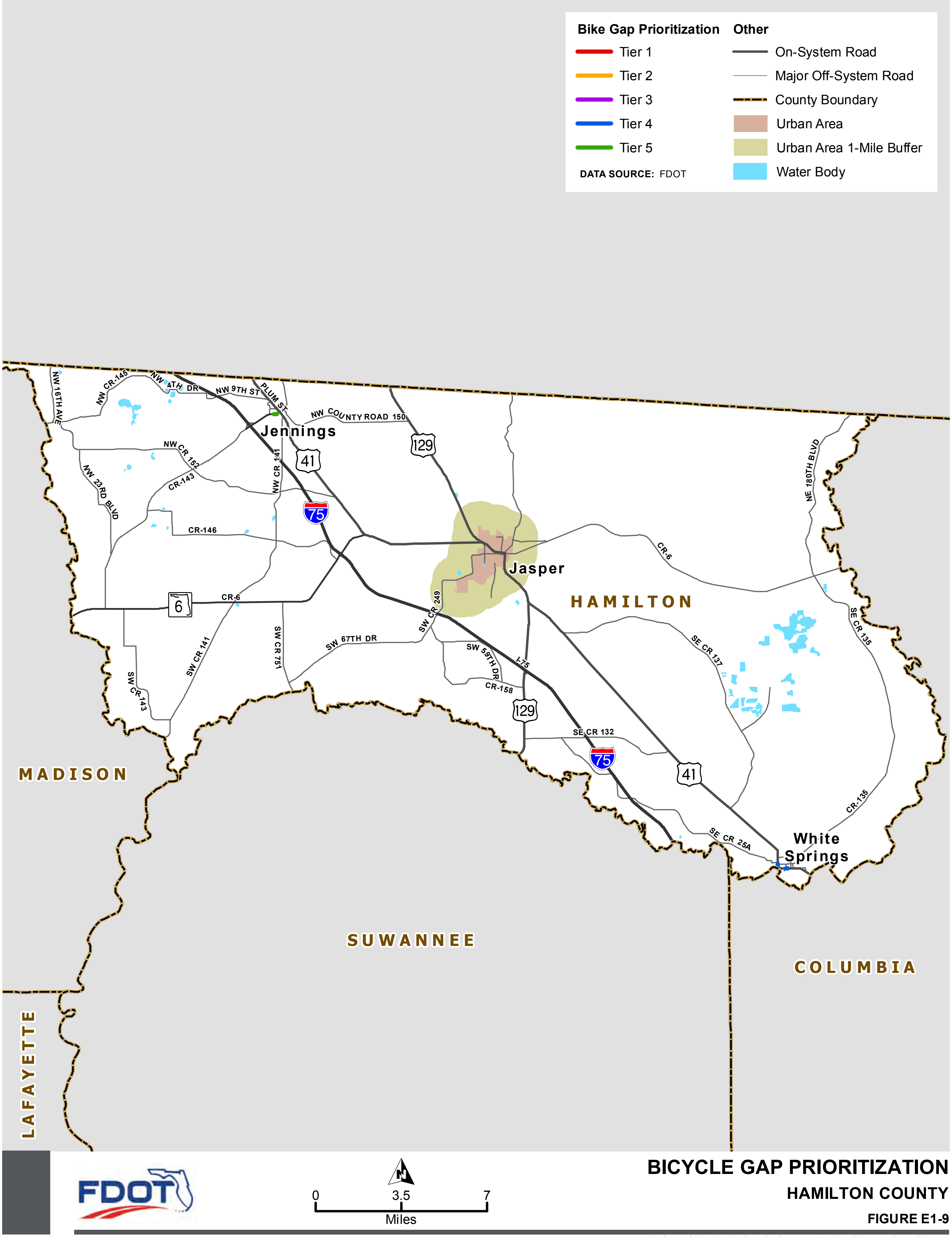



FDOT

# BICYCLE GAP PRIORITIZATION

## GILCHRIST COUNTY

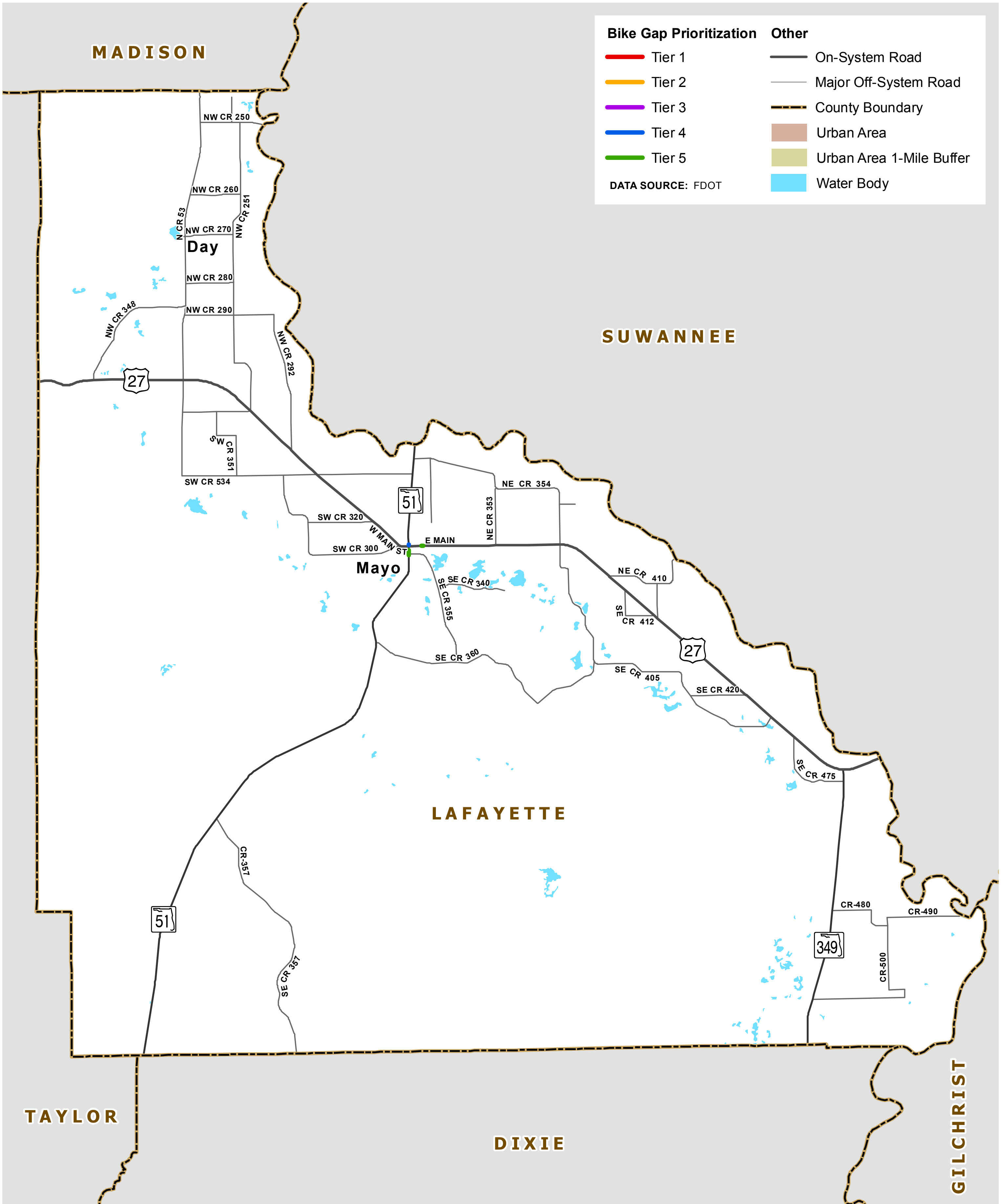
FIGURE E1-8

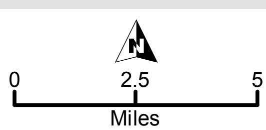



BICYCLE GAP PRIORITIZATION

HAMILTON COUNTY

FIGURE E1-9

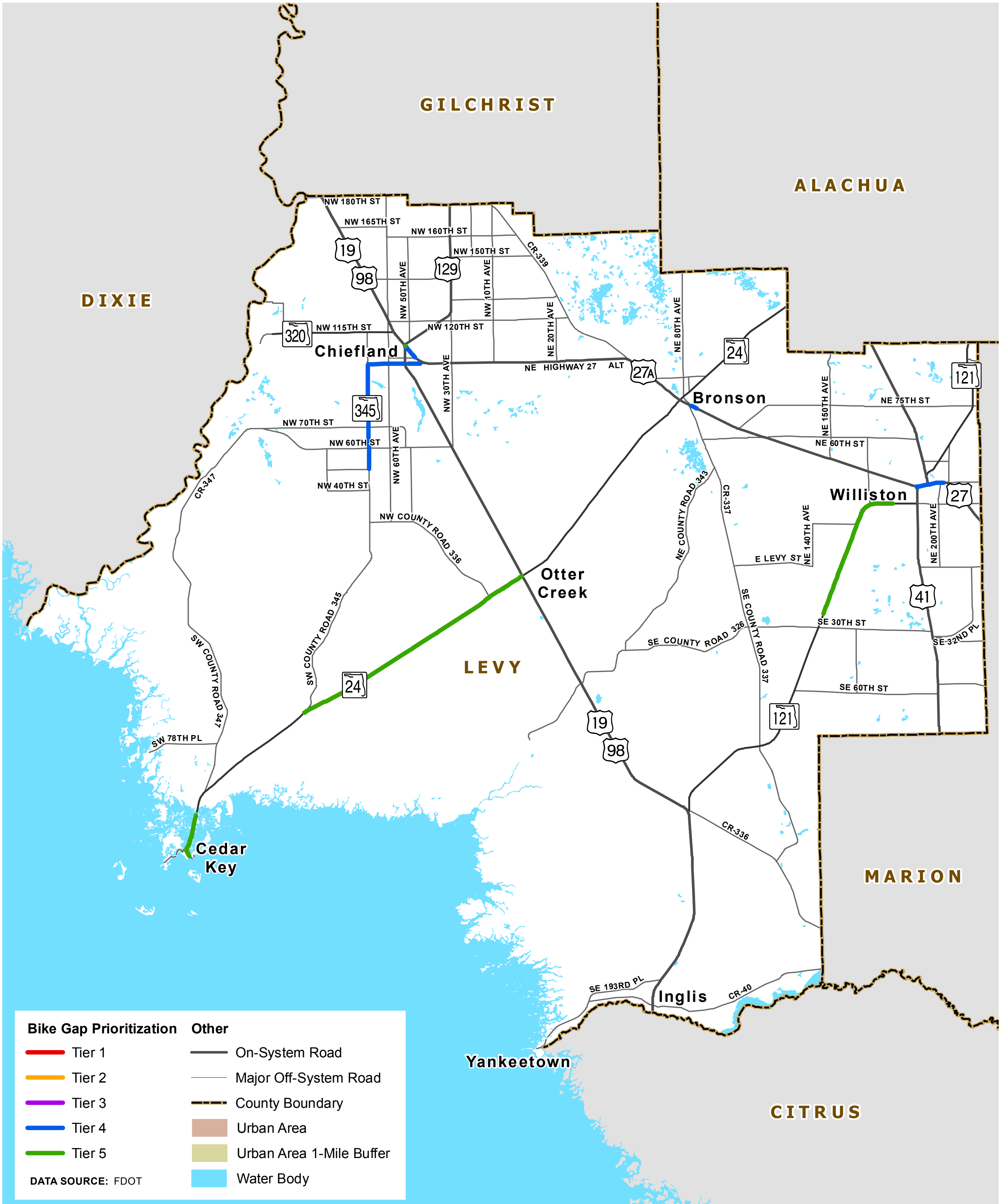


**BICYCLE GAP PRIORITIZATION**

**LAFAYETTE COUNTY**

**FIGURE E1-10**



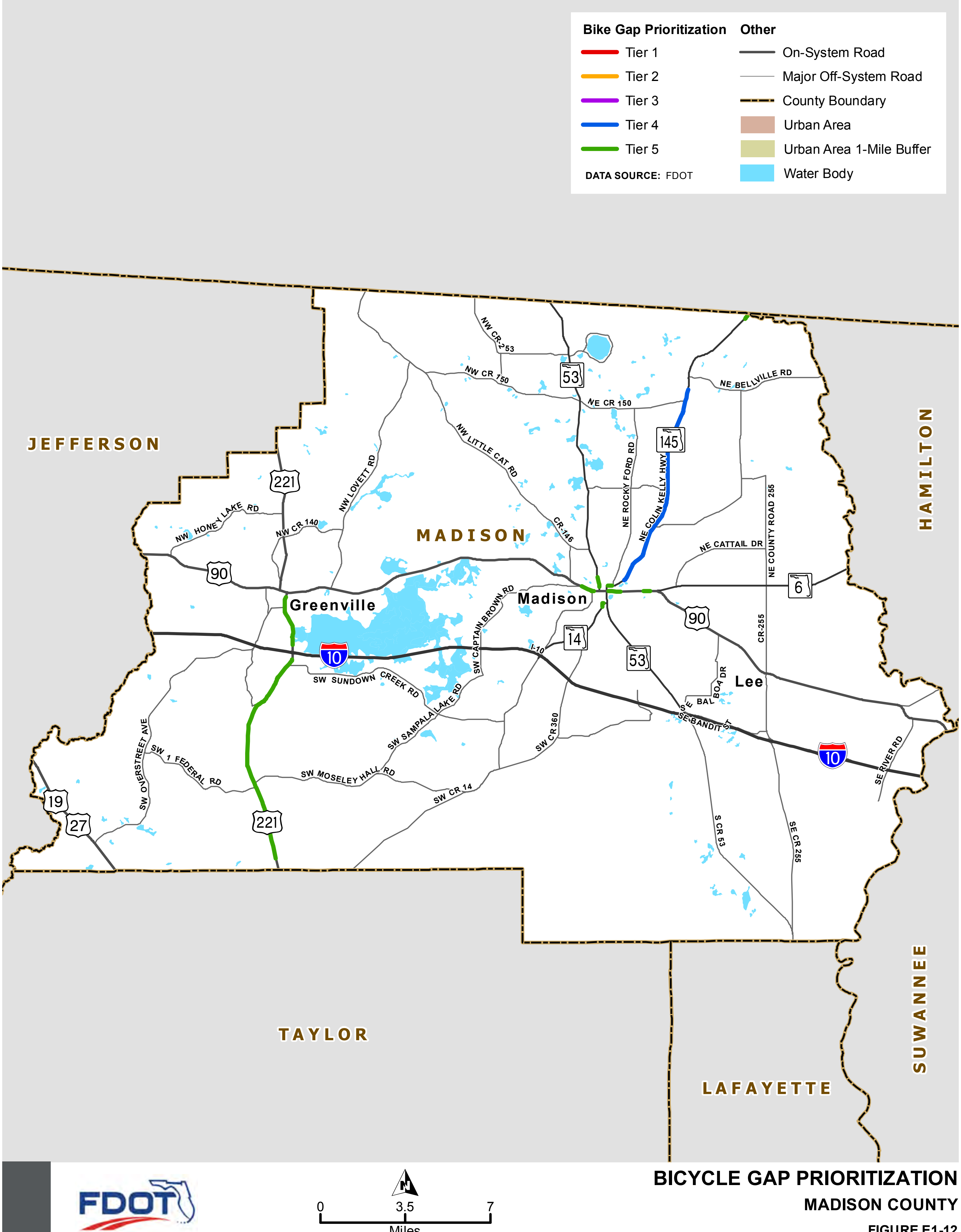

0 4.5 9
Miles

# BICYCLE GAP PRIORITIZATION

## LEVY COUNTY

FIGURE E1-11

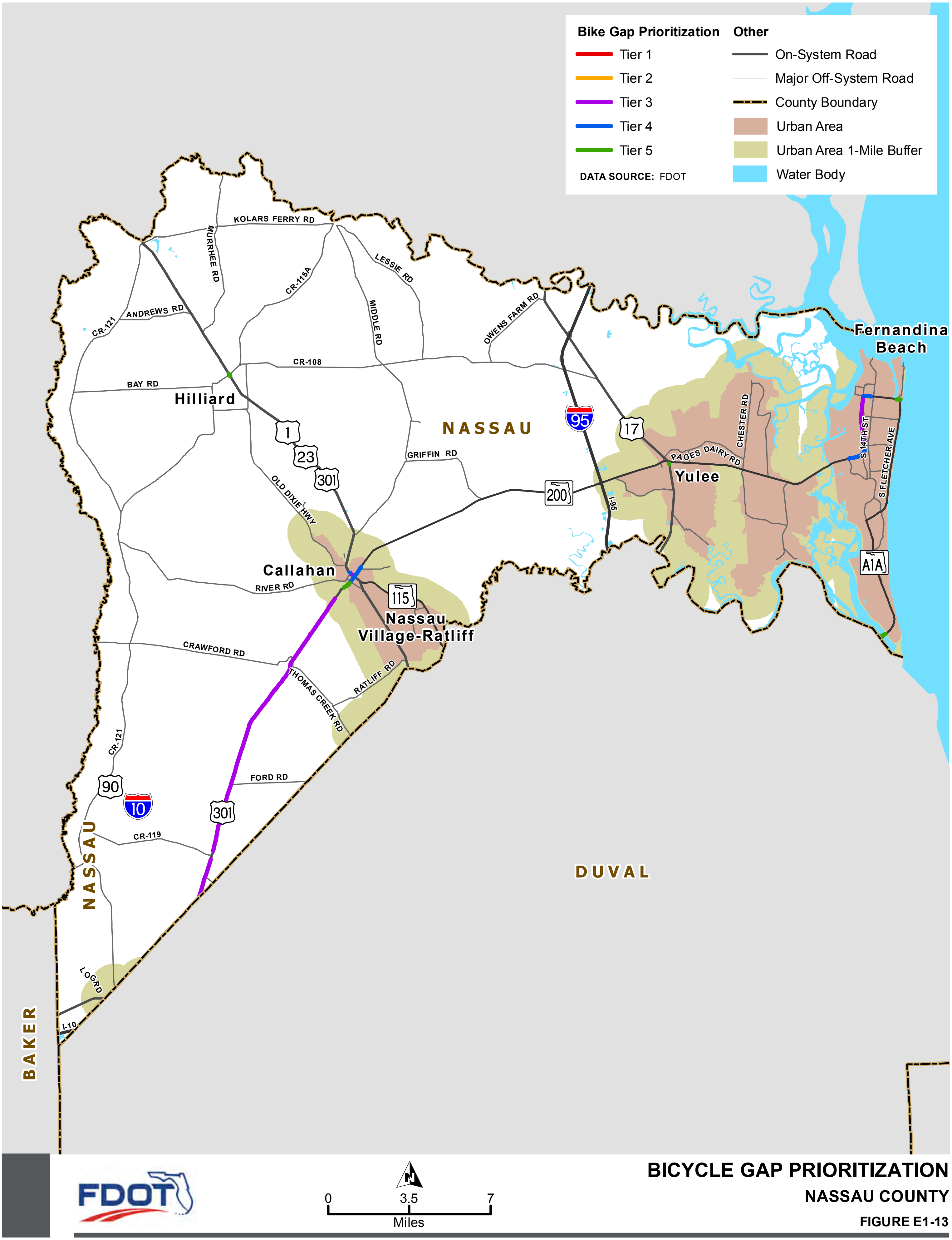
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# BICYCLE GAP PRIORITIZATION

## MADISON COUNTY

FIGURE E1-12

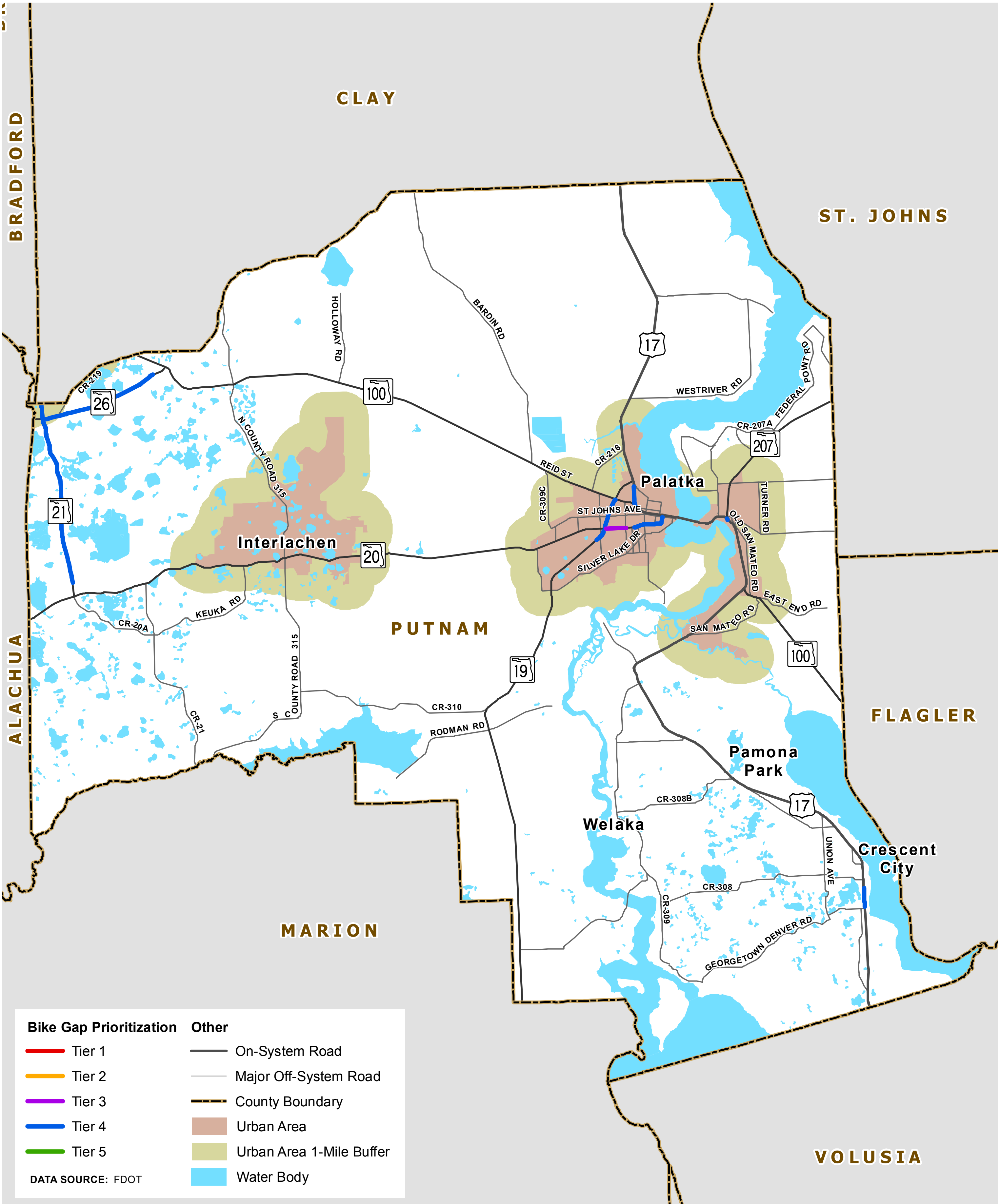



# BICYCLE GAP PRIORITIZATION

## NASSAU COUNTY

FIGURE E1-13

FDOT

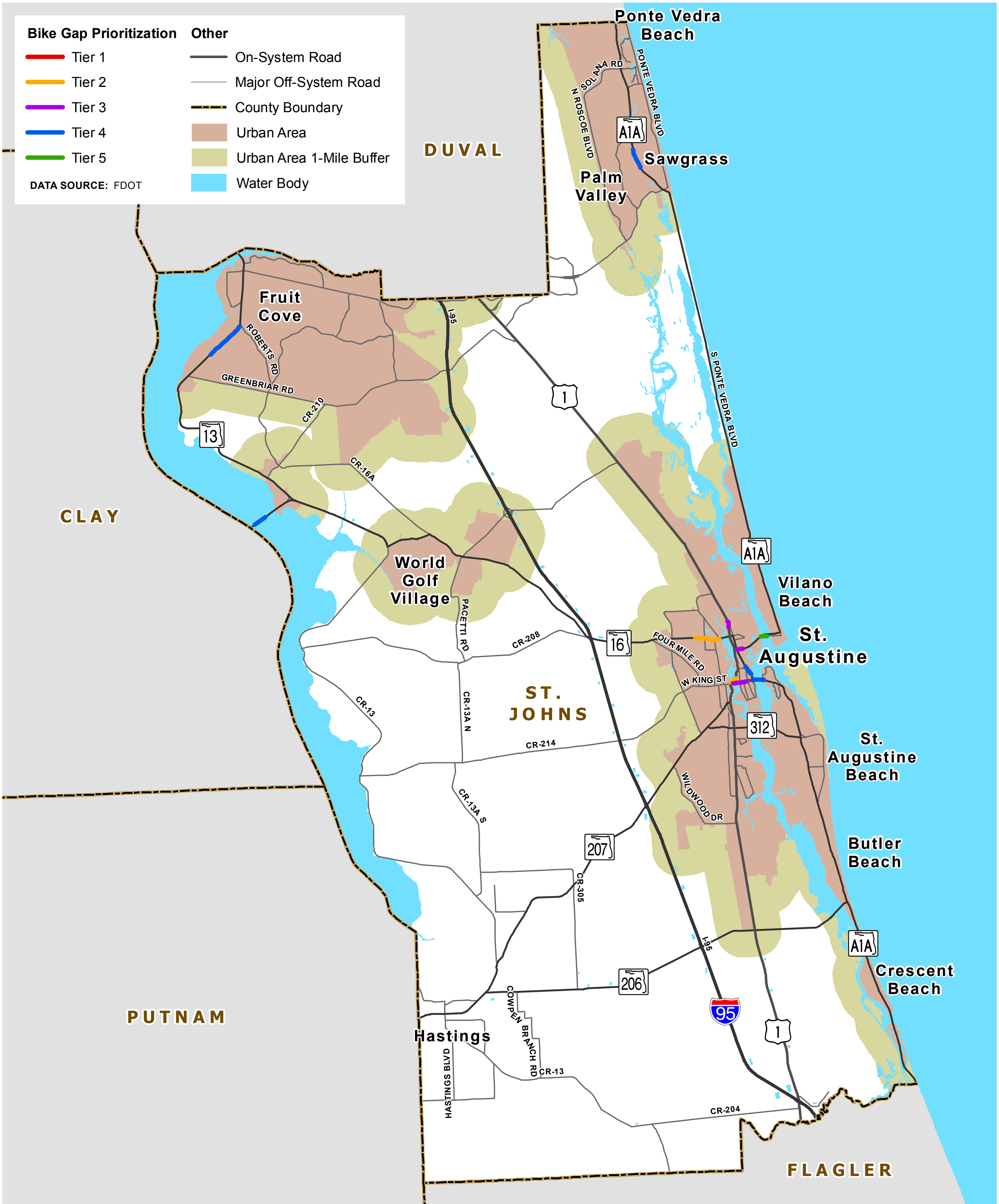



0 3.5 7
Miles

**BICYCLE GAP PRIORITIZATION**

**PUTNAM COUNTY**

**FIGURE E1-14**

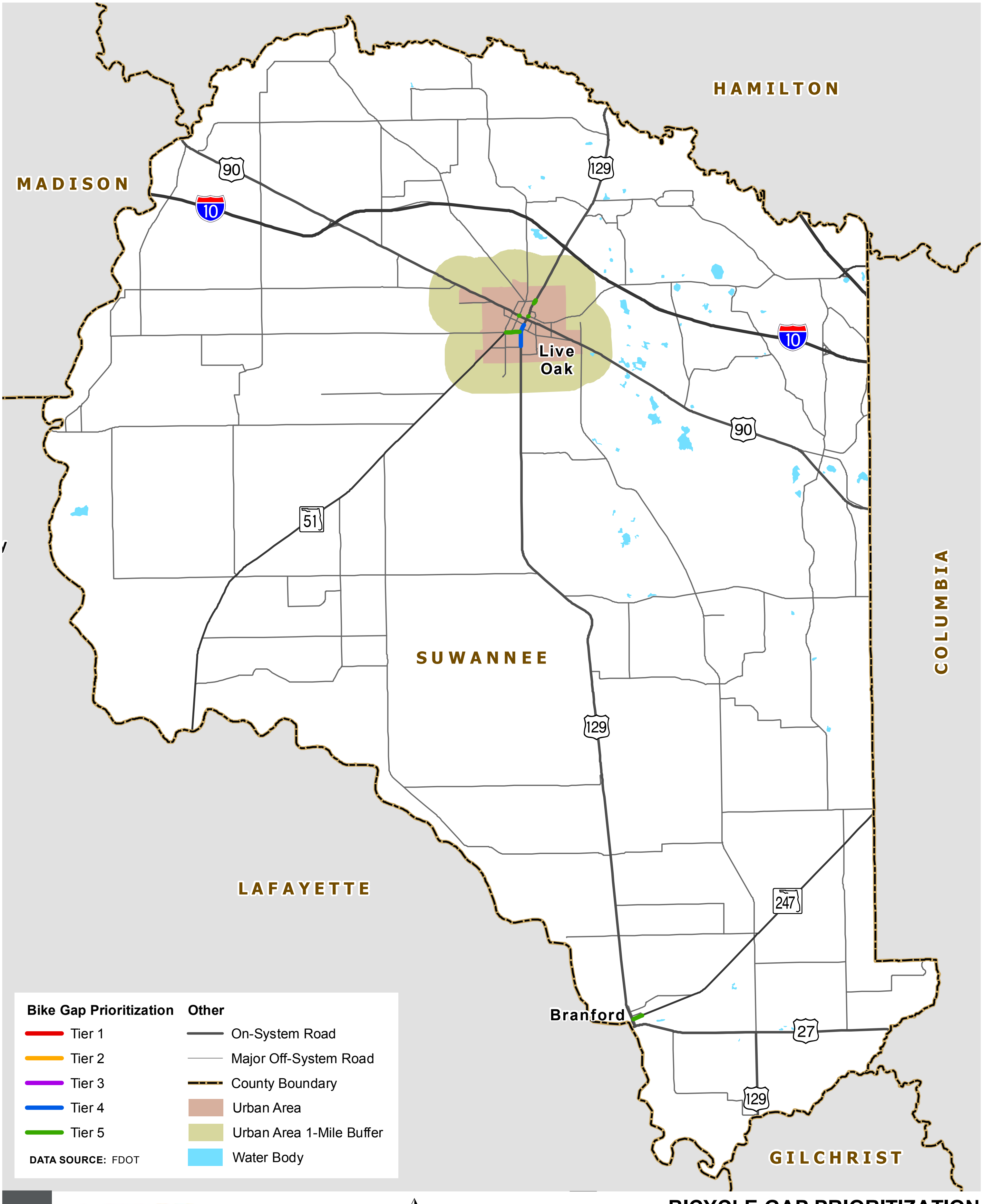



0 3.5 7
Miles

# BICYCLE GAP PRIORITIZATION

## ST. JOHNS COUNTY

FIGURE E1-15

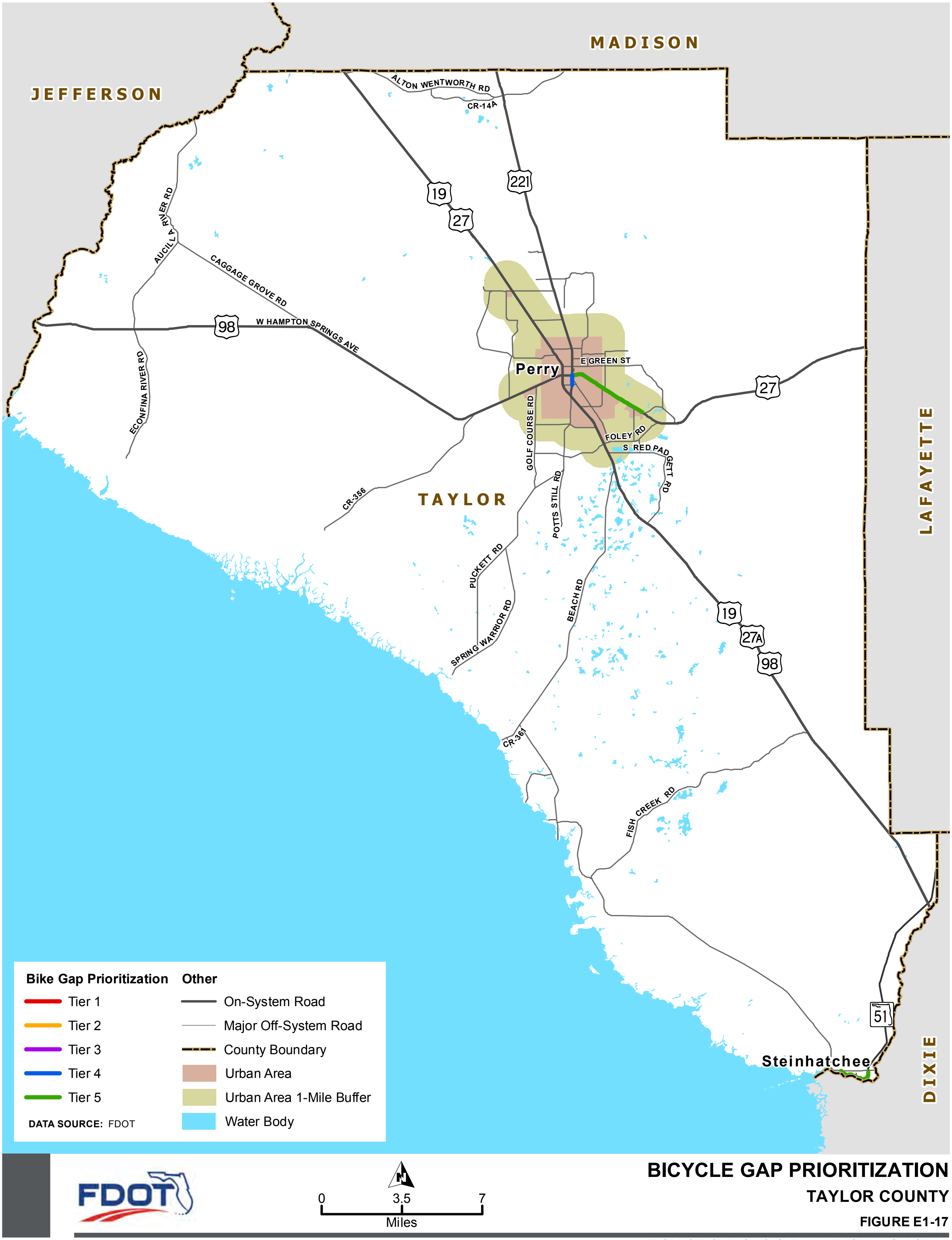



FDOT

# BICYCLE GAP PRIORITIZATION

## SUWANNEE COUNTY

FIGURE E1-16

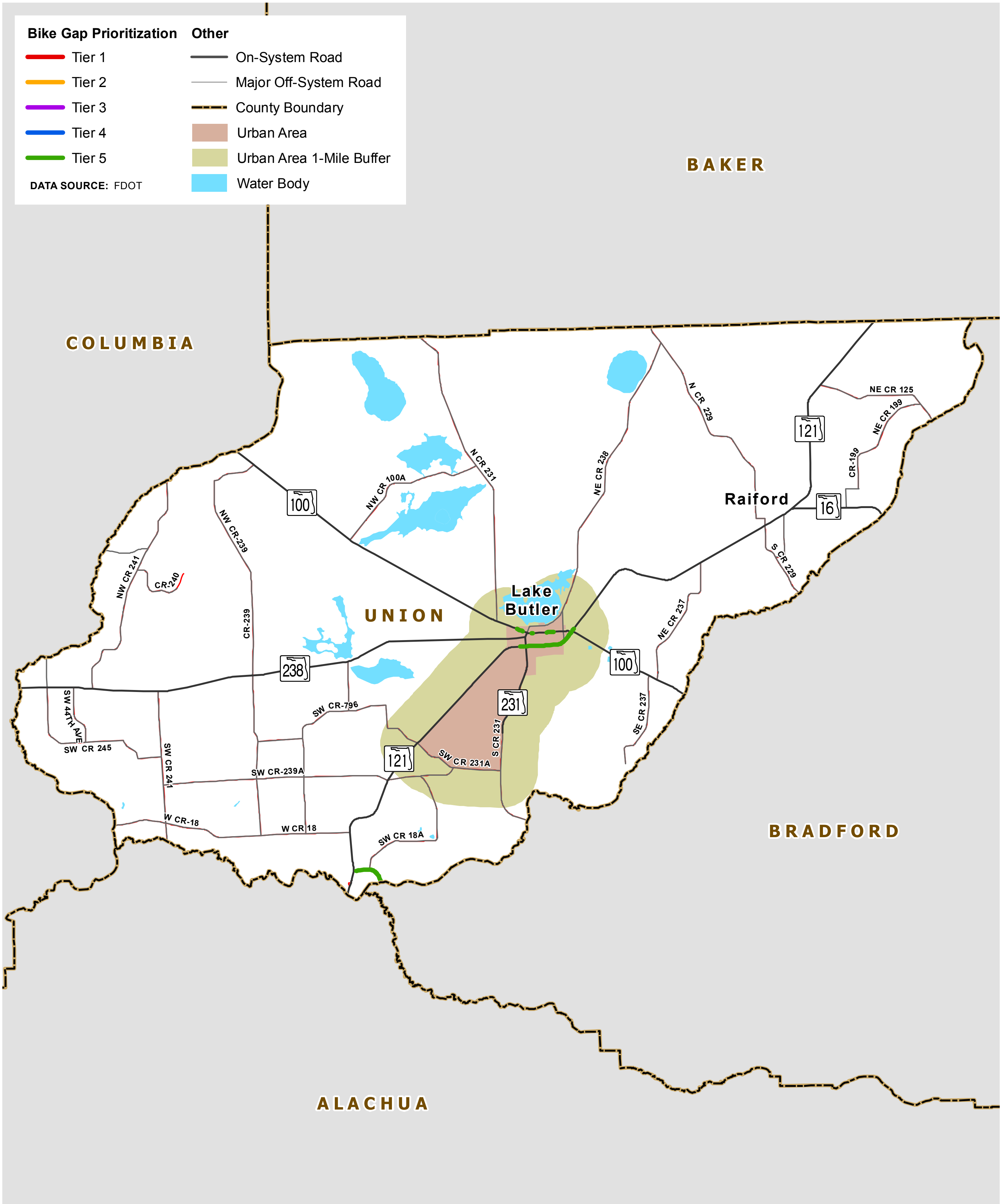



FDOT

**BICYCLE GAP PRIORITIZATION**

**TAYLOR COUNTY**

**FIGURE E1-17**

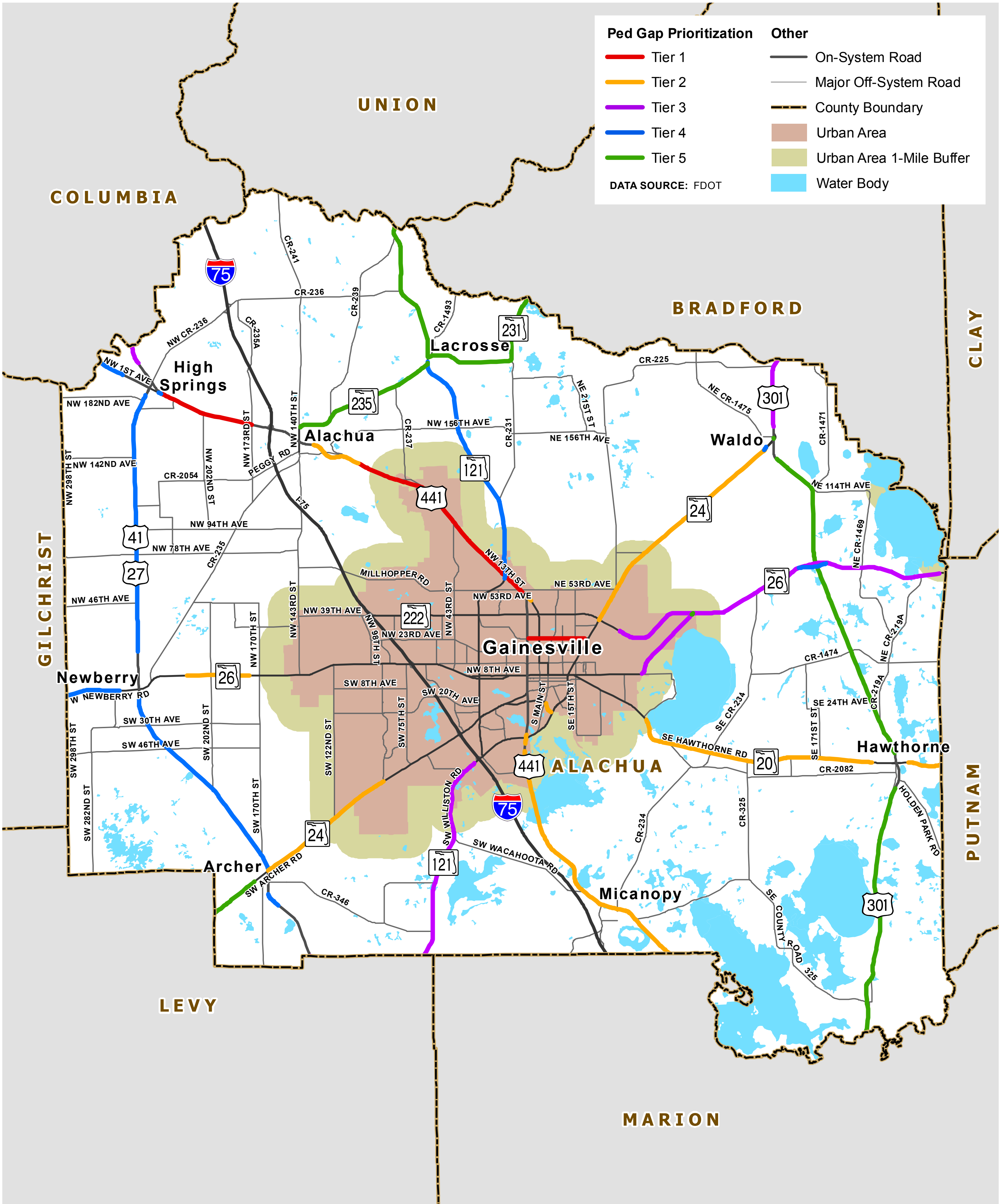



**BICYCLE GAP PRIORITIZATION**

**UNION COUNTY**

**FIGURE E1-18**

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY



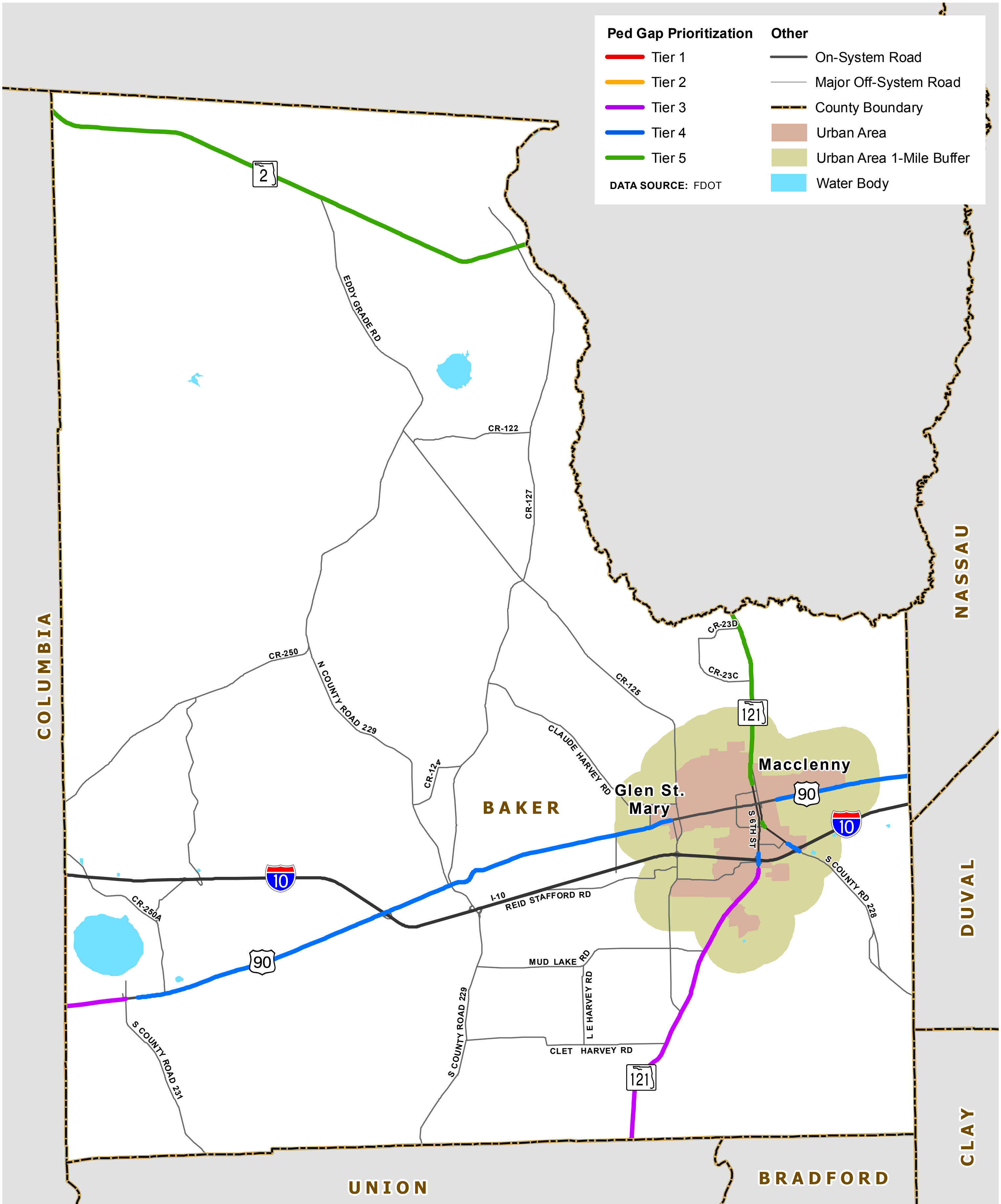

0 3.5 7
Miles

# PEDESTRIAN GAP PRIORITIZATION

## ALACHUA COUNTY

**FIGURE E2-1**

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY

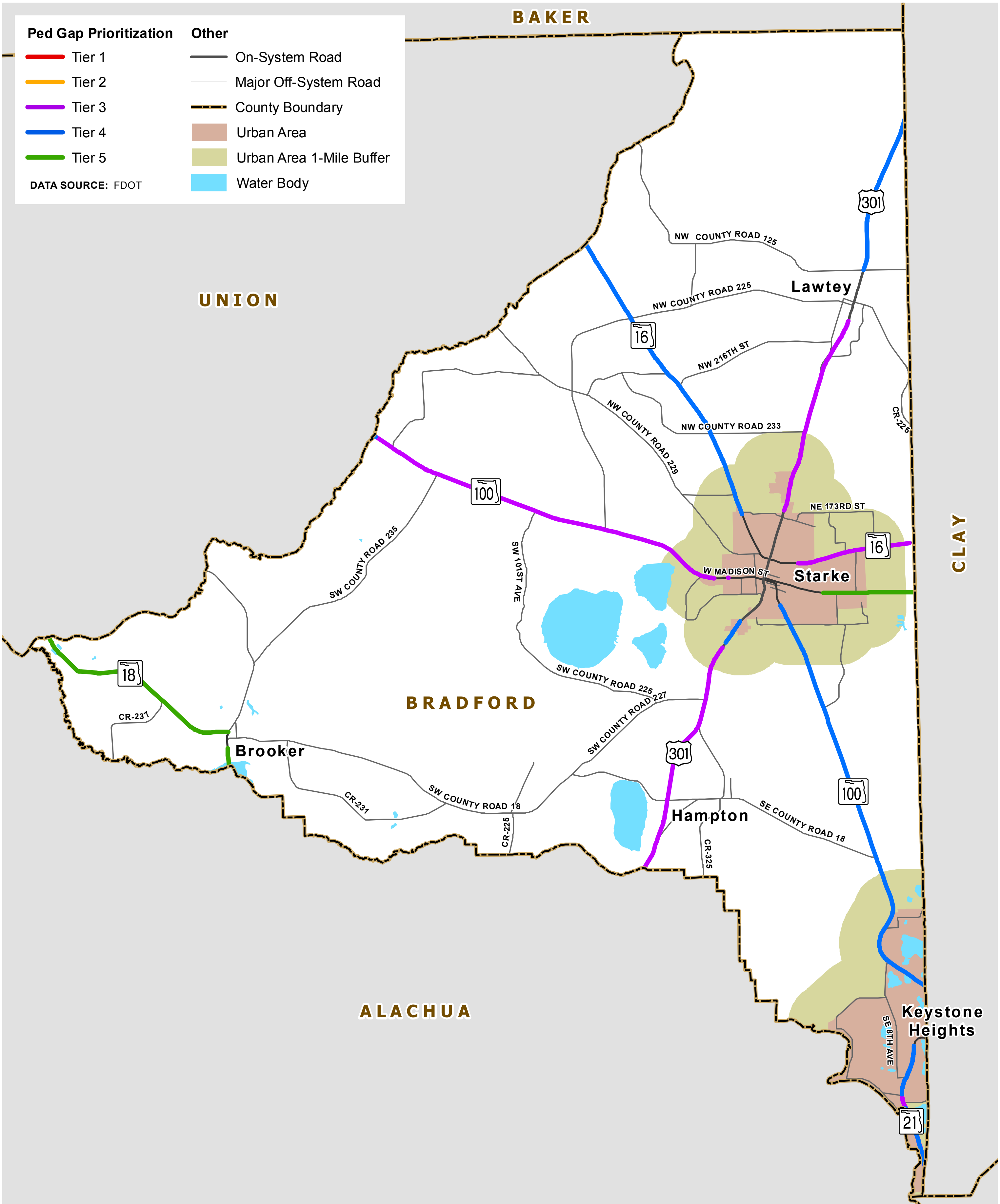



0 2.5 5
Miles

# PEDESTRIAN GAP PRIORITIZATION

## BAKER COUNTY

FIGURE E2-2



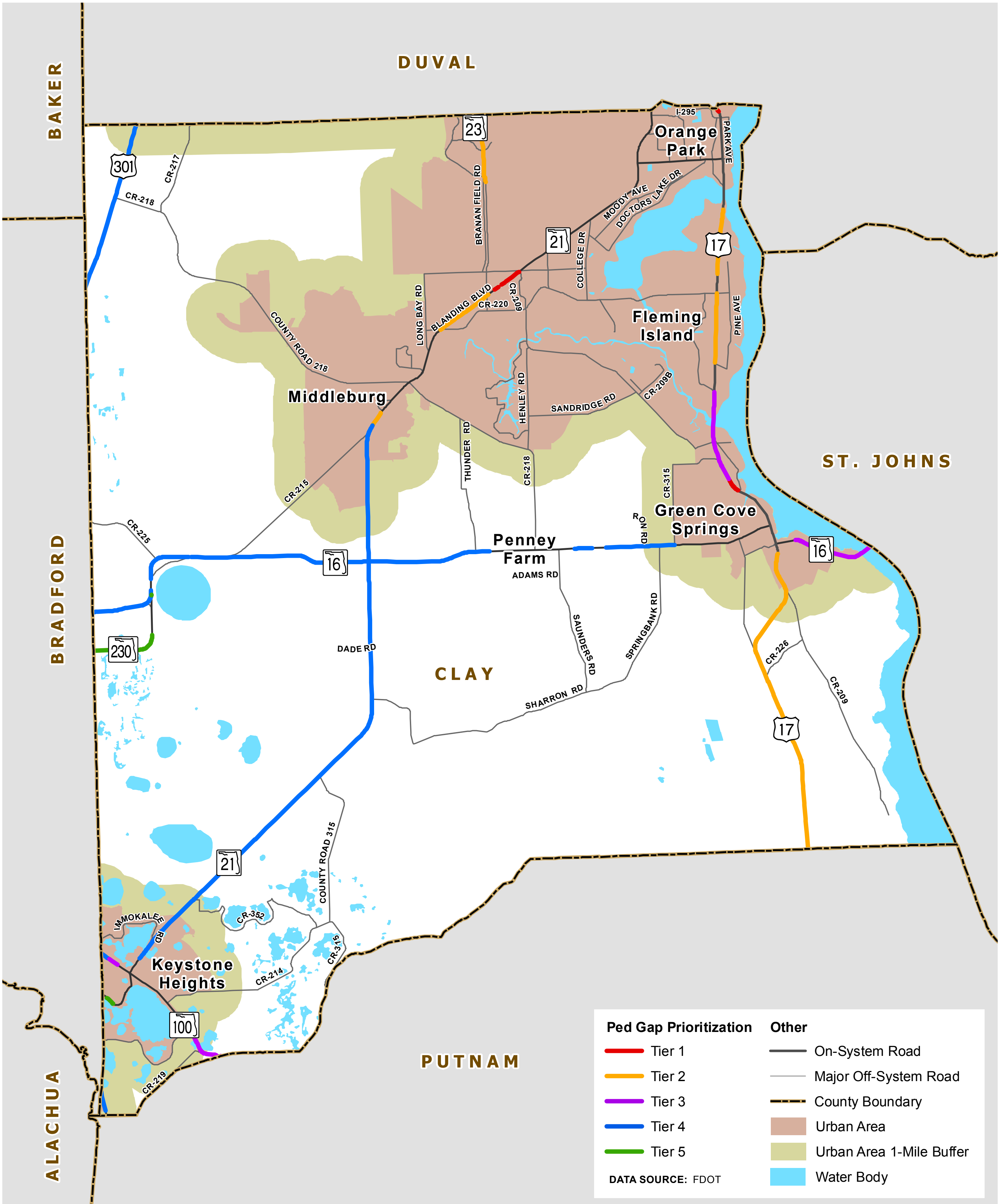

0 2 4
Miles

FDOT

# PEDESTRIAN GAP PRIORITIZATION

## BRADFORD COUNTY

FIGURE E2-3

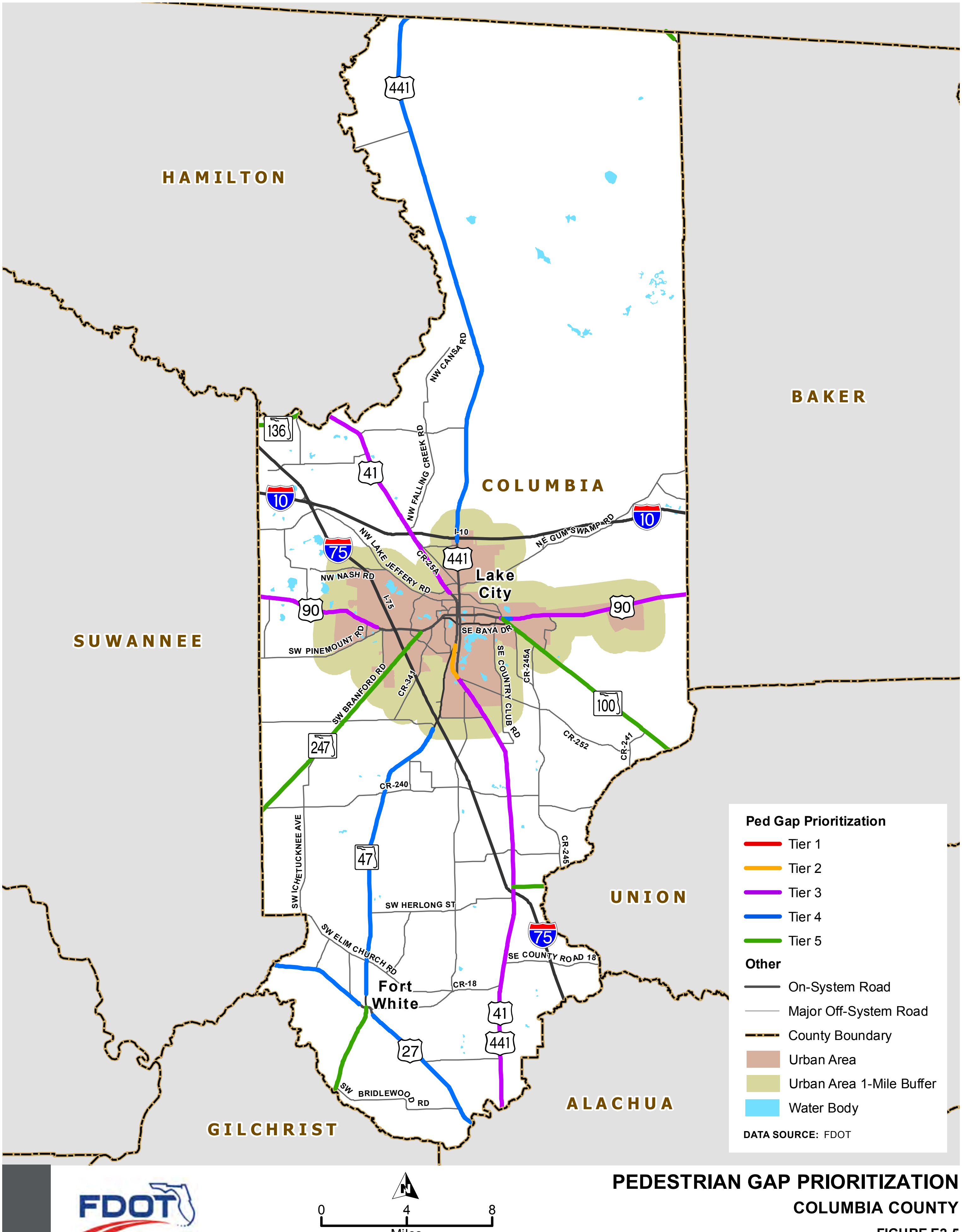



0 3 6
Miles

# PEDESTRIAN GAP PRIORITIZATION

## CLAY COUNTY

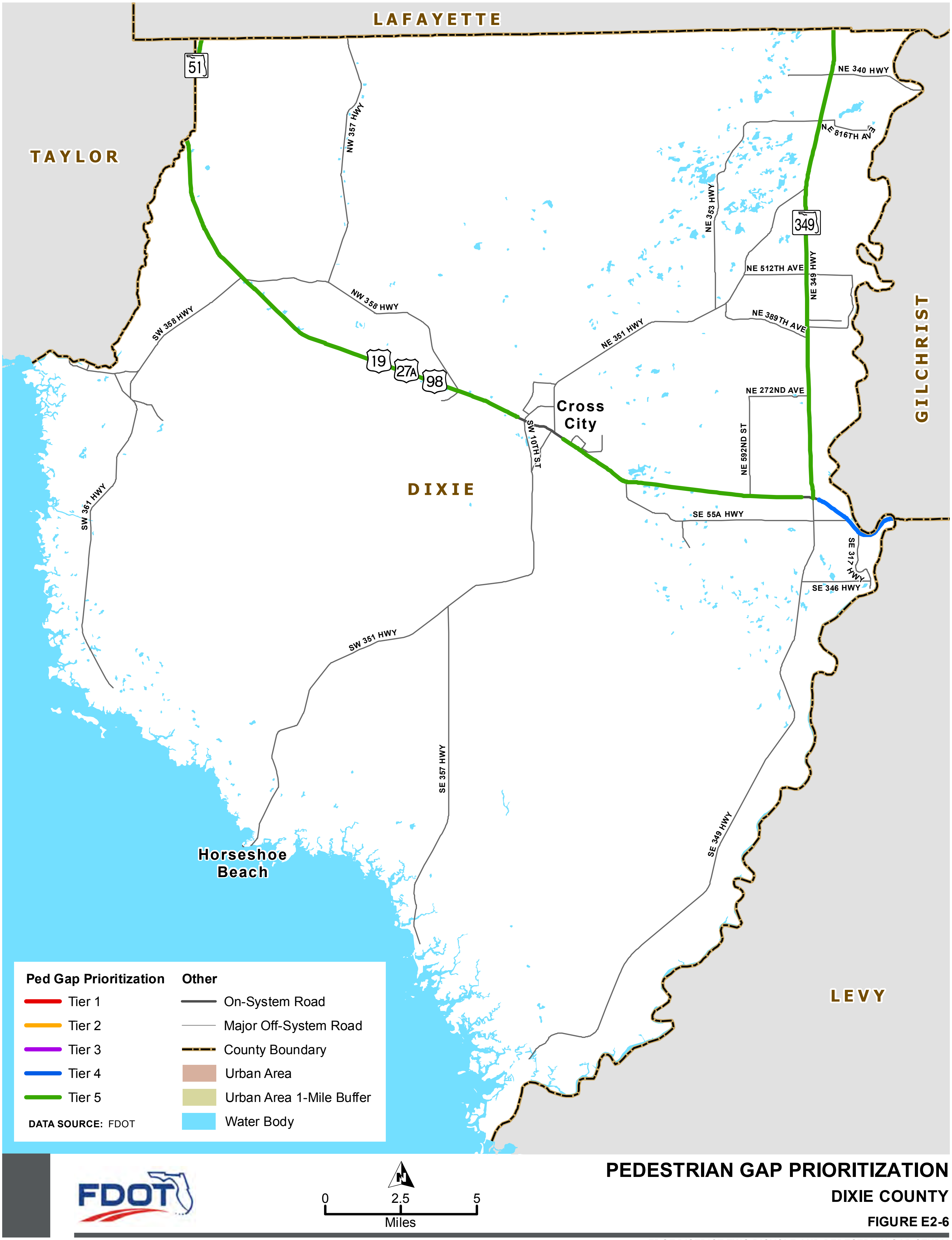
**FIGURE E2-4**




# PEDESTRIAN GAP PRIORITIZATION

## COLUMBIA COUNTY

FIGURE E2-5

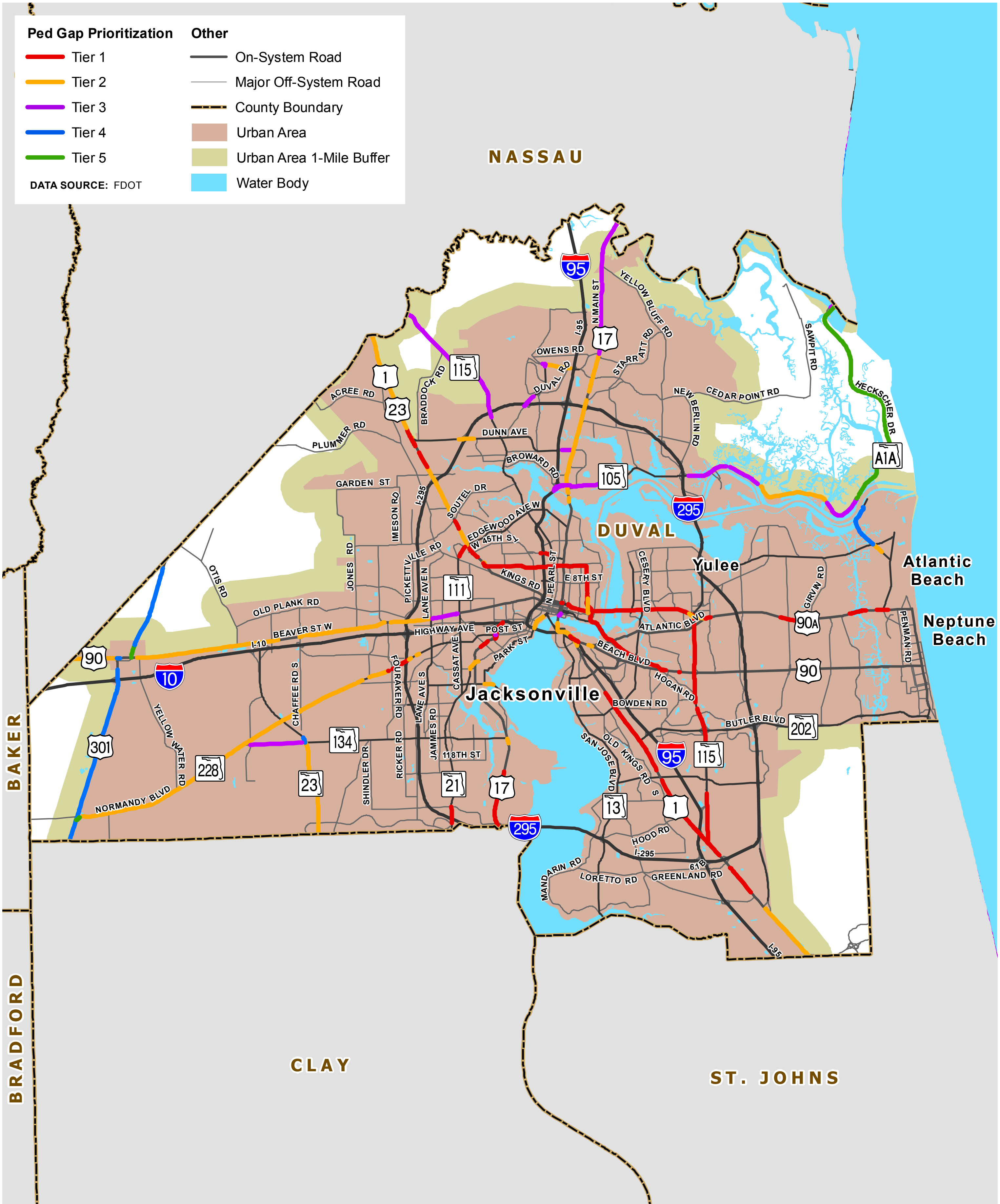



FDOT

# PEDESTRIAN GAP PRIORITIZATION

## DIXIE COUNTY

FIGURE E2-6




0 4 8
Miles

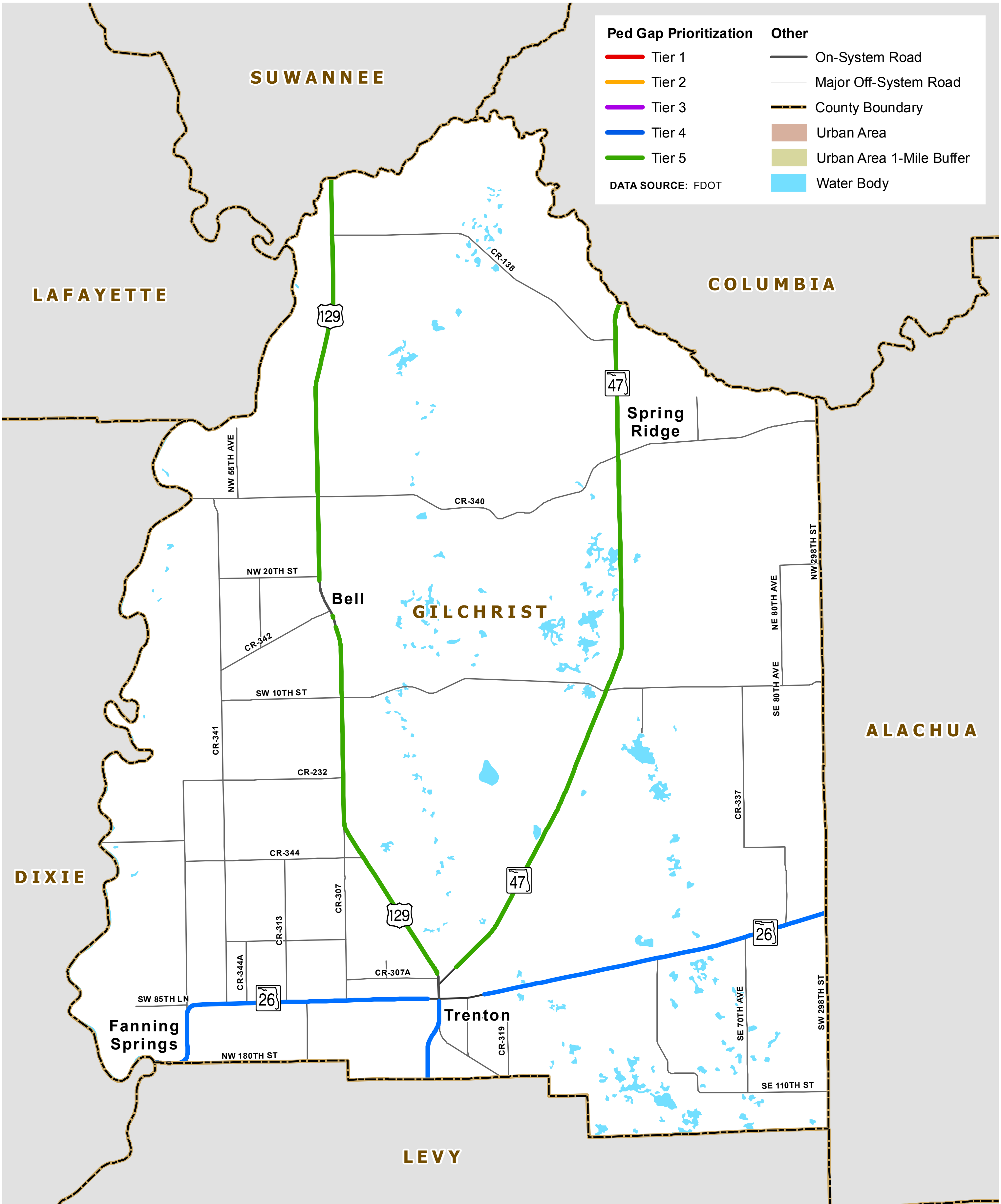
FDOT

# PEDESTRIAN GAP PRIORITIZATION

## DUVAL COUNTY

FIGURE E2-7

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY



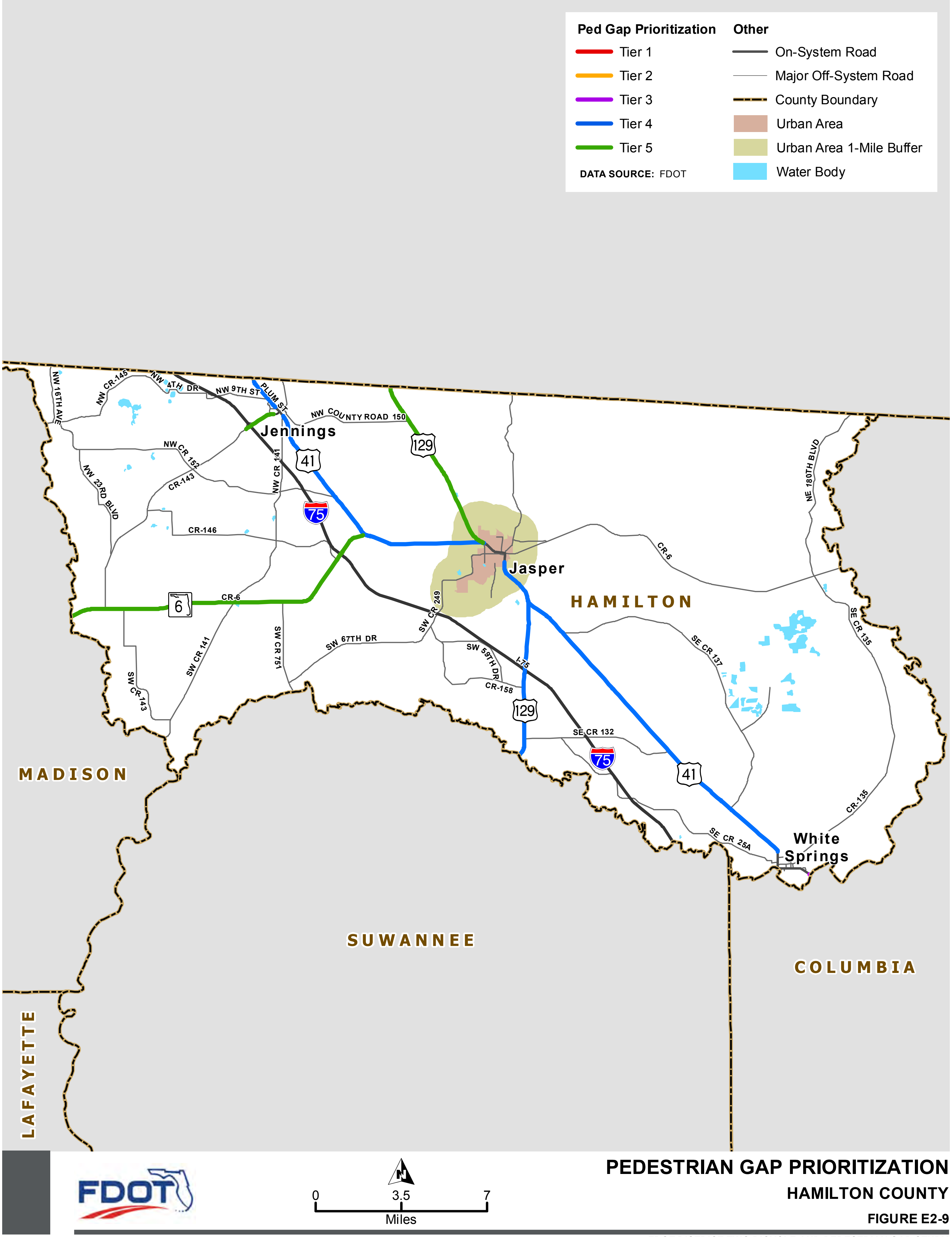

FDOT

## PEDESTRIAN GAP PRIORITIZATION

### GILCHRIST COUNTY

FIGURE E2-8

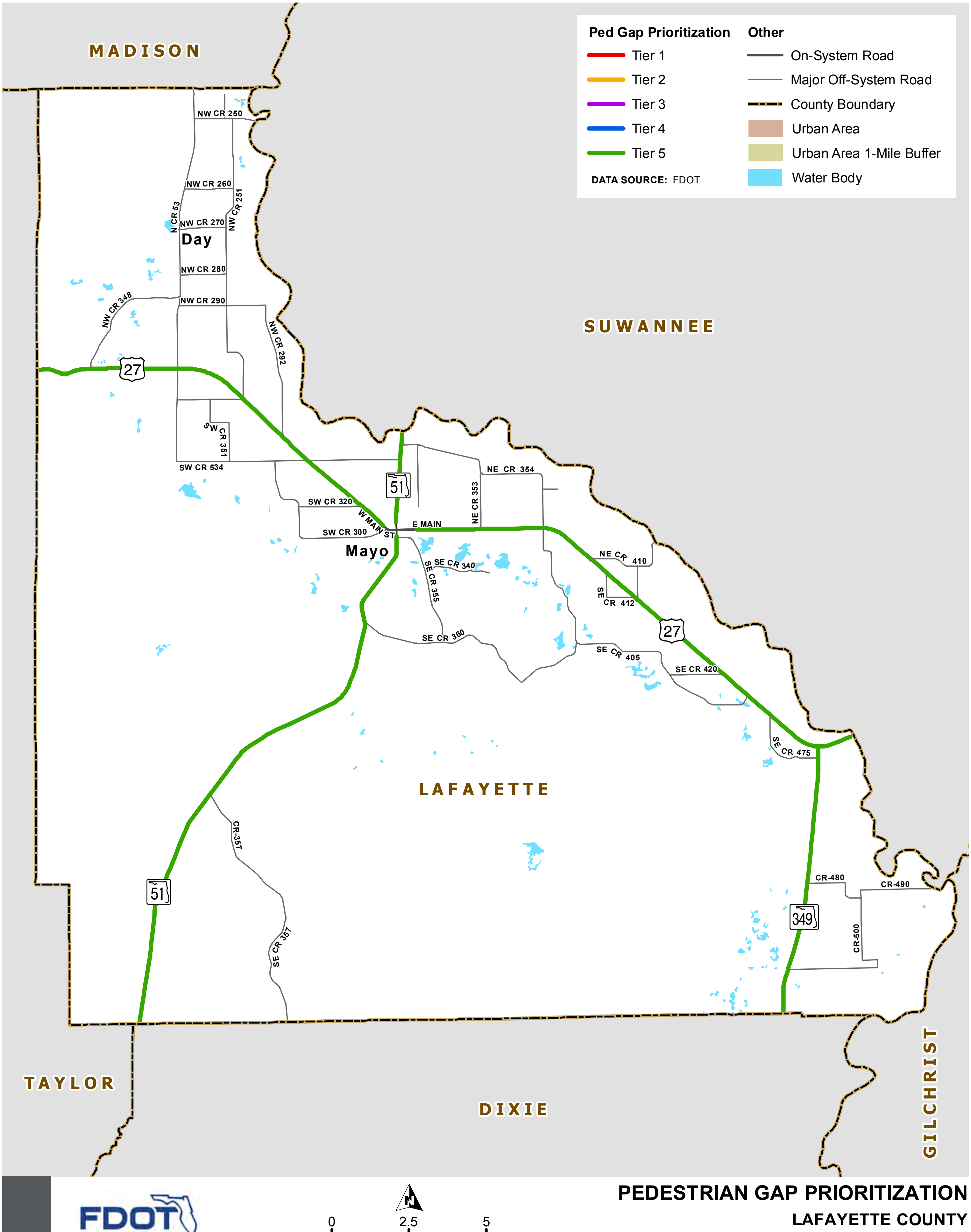
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




## PEDESTRIAN GAP PRIORITIZATION

### HAMILTON COUNTY

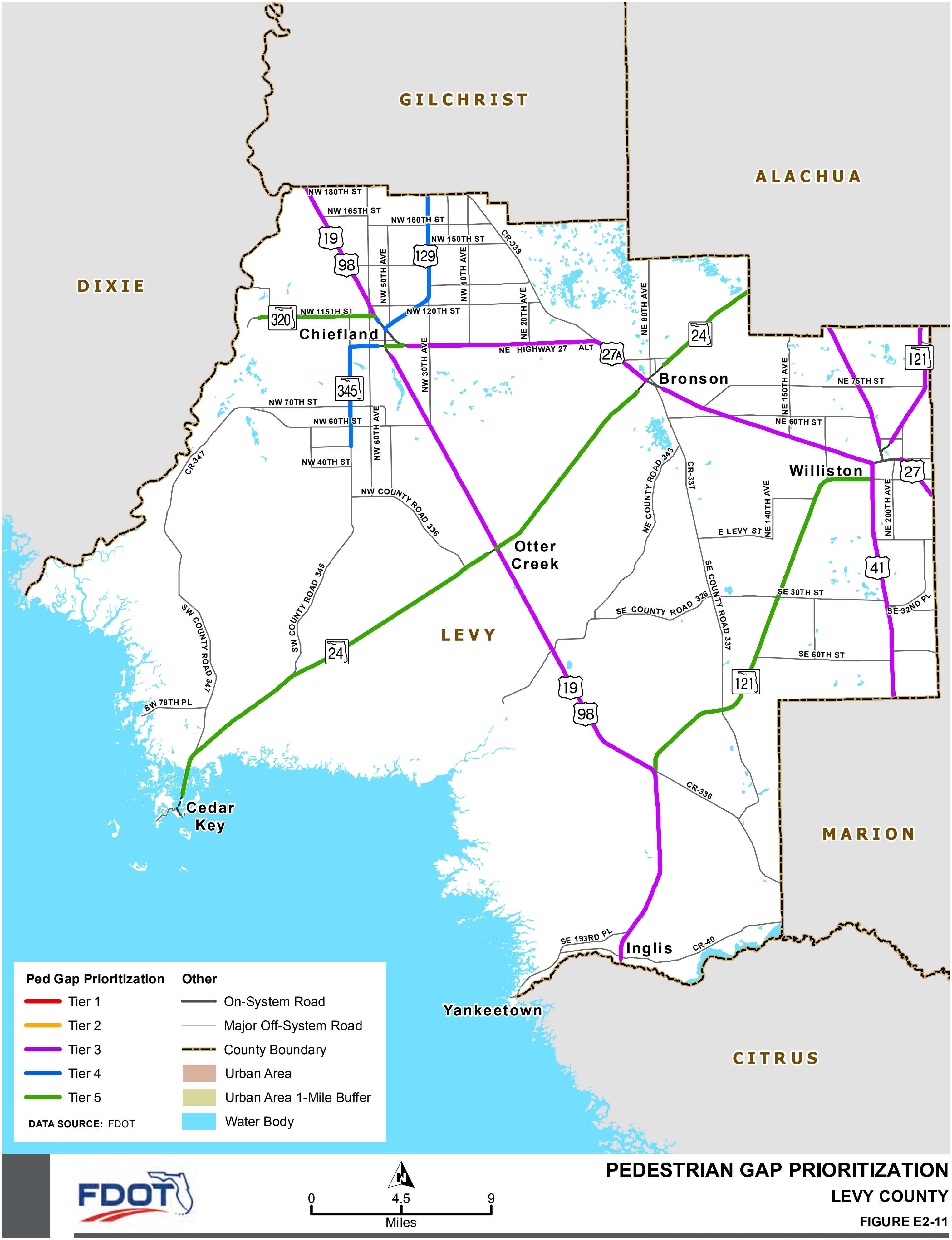
FIGURE E2-9




# PEDESTRIAN GAP PRIORITIZATION

## LAFAYETTE COUNTY

**FIGURE E2-10**

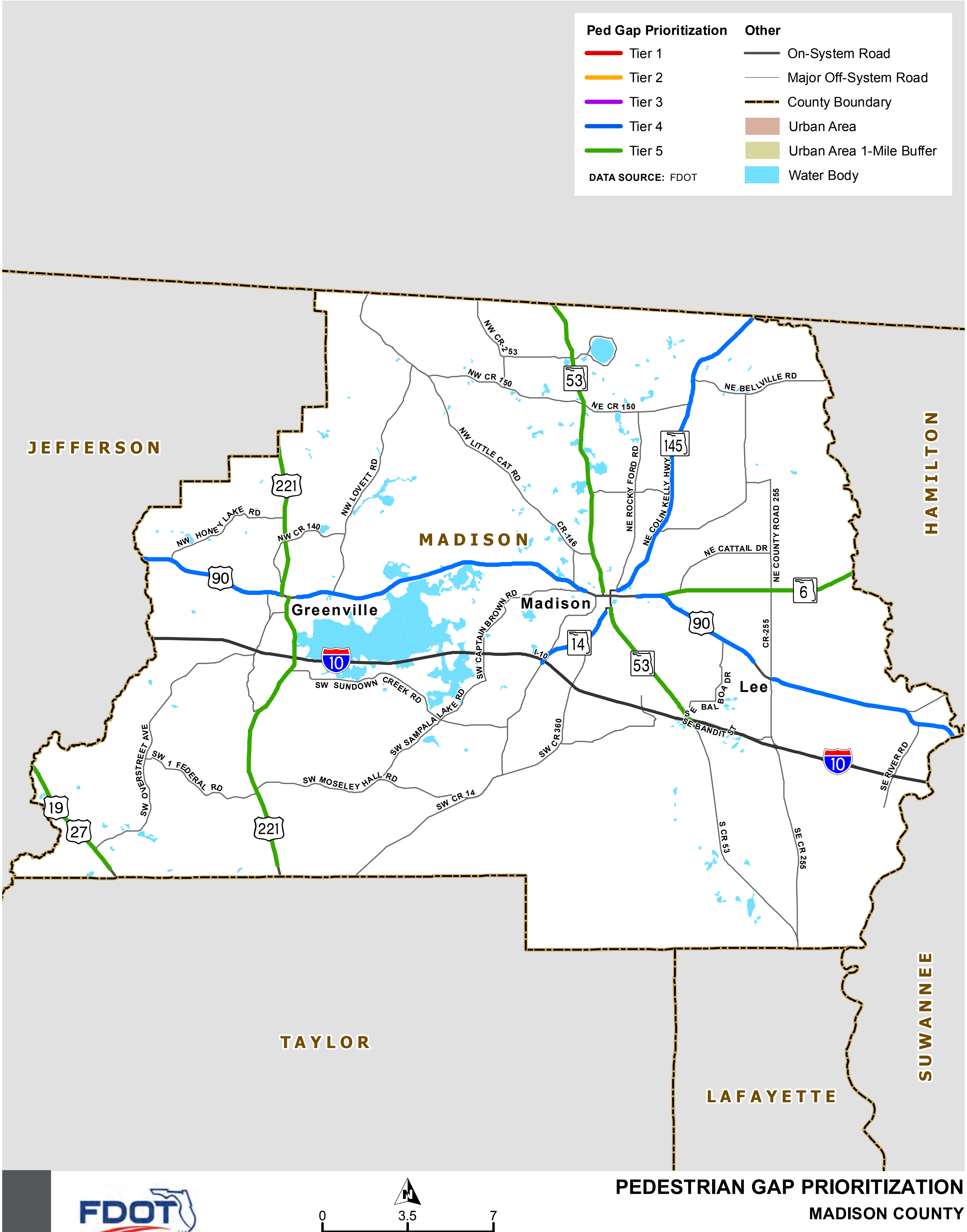



FDOT

# PEDESTRIAN GAP PRIORITIZATION

## LEVY COUNTY

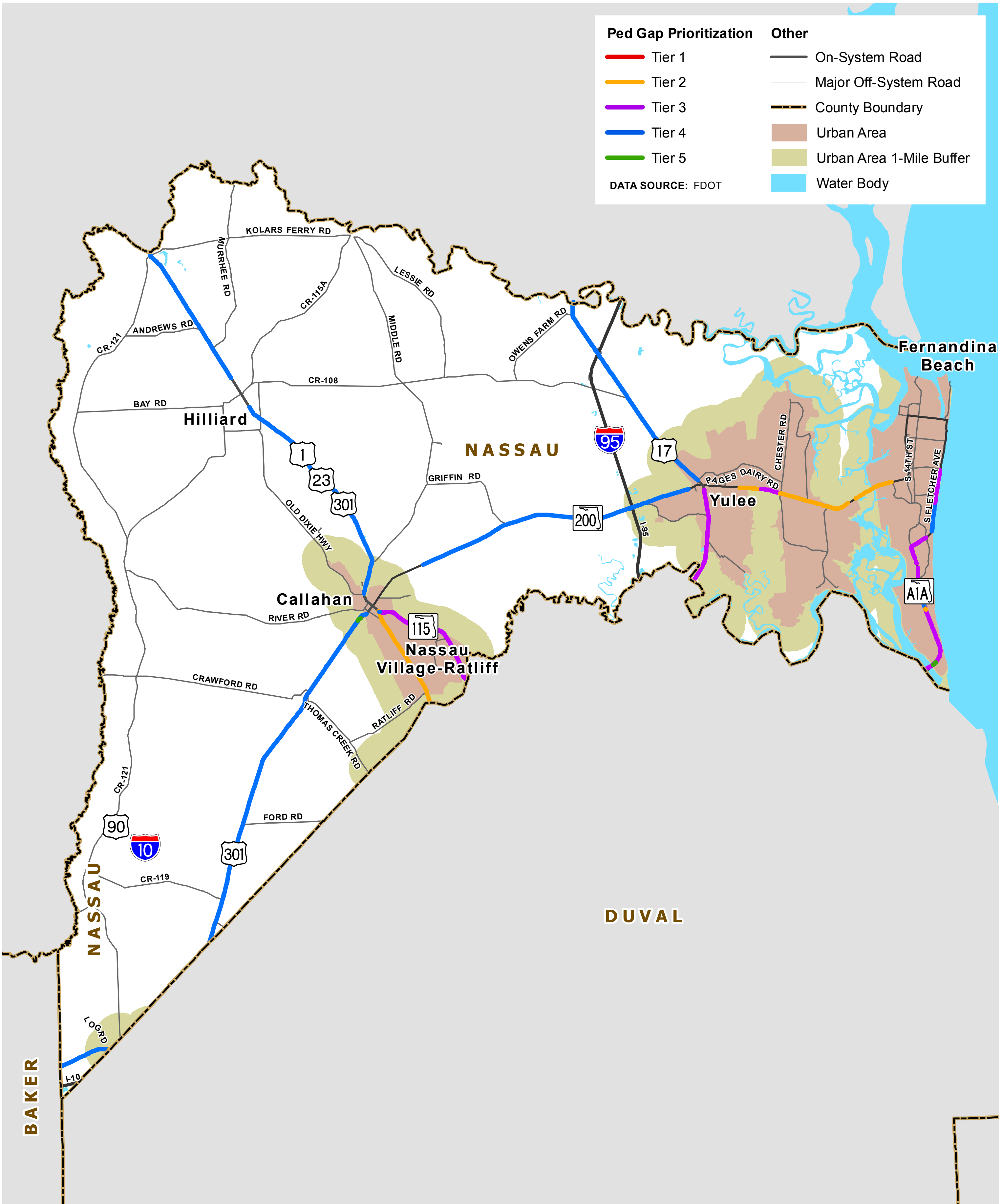
**FIGURE E2-11**




# PEDESTRIAN GAP PRIORITIZATION

## MADISON COUNTY

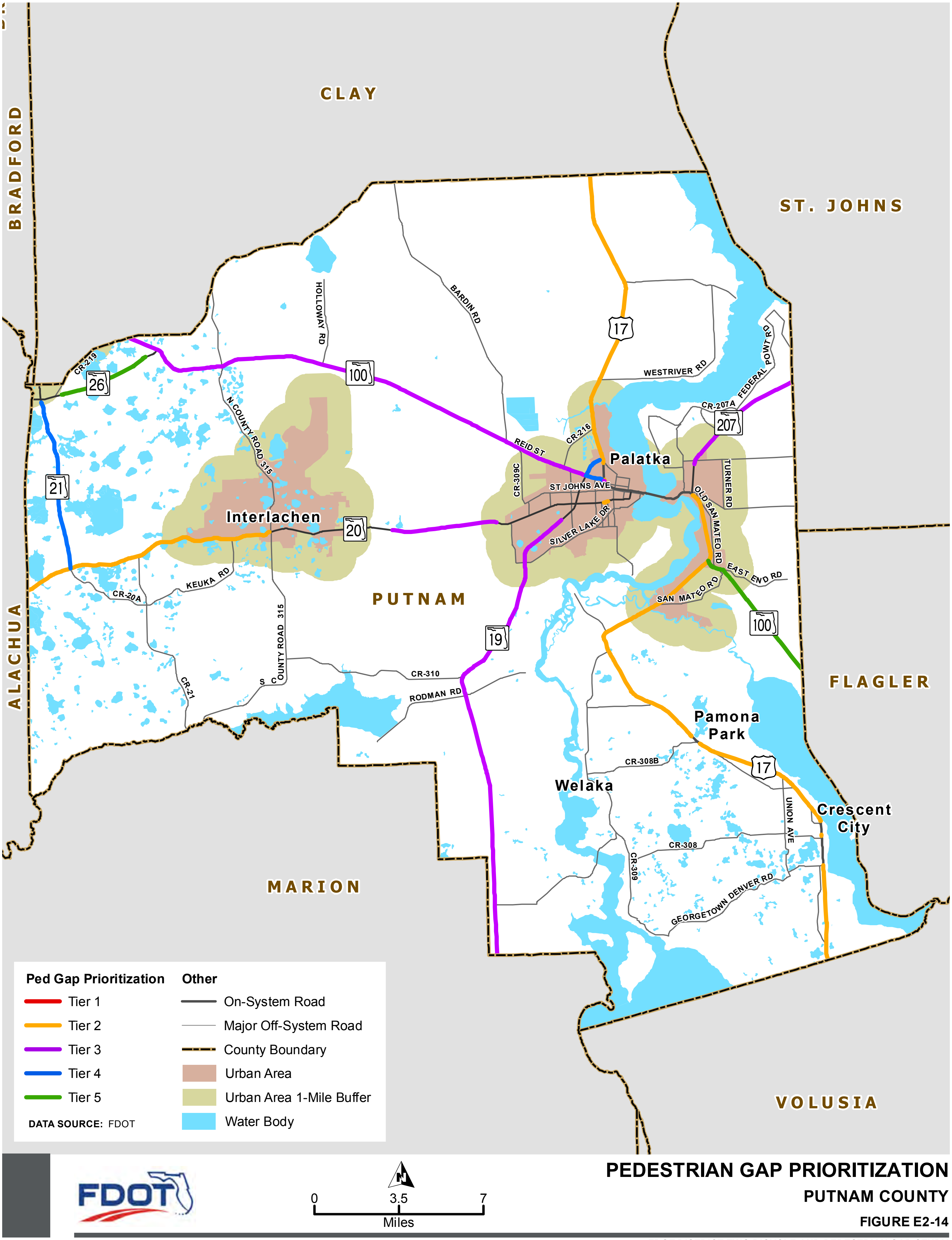
**FIGURE E2-12**




# PEDESTRIAN GAP PRIORITIZATION

## NASSAU COUNTY

FIGURE E2-13



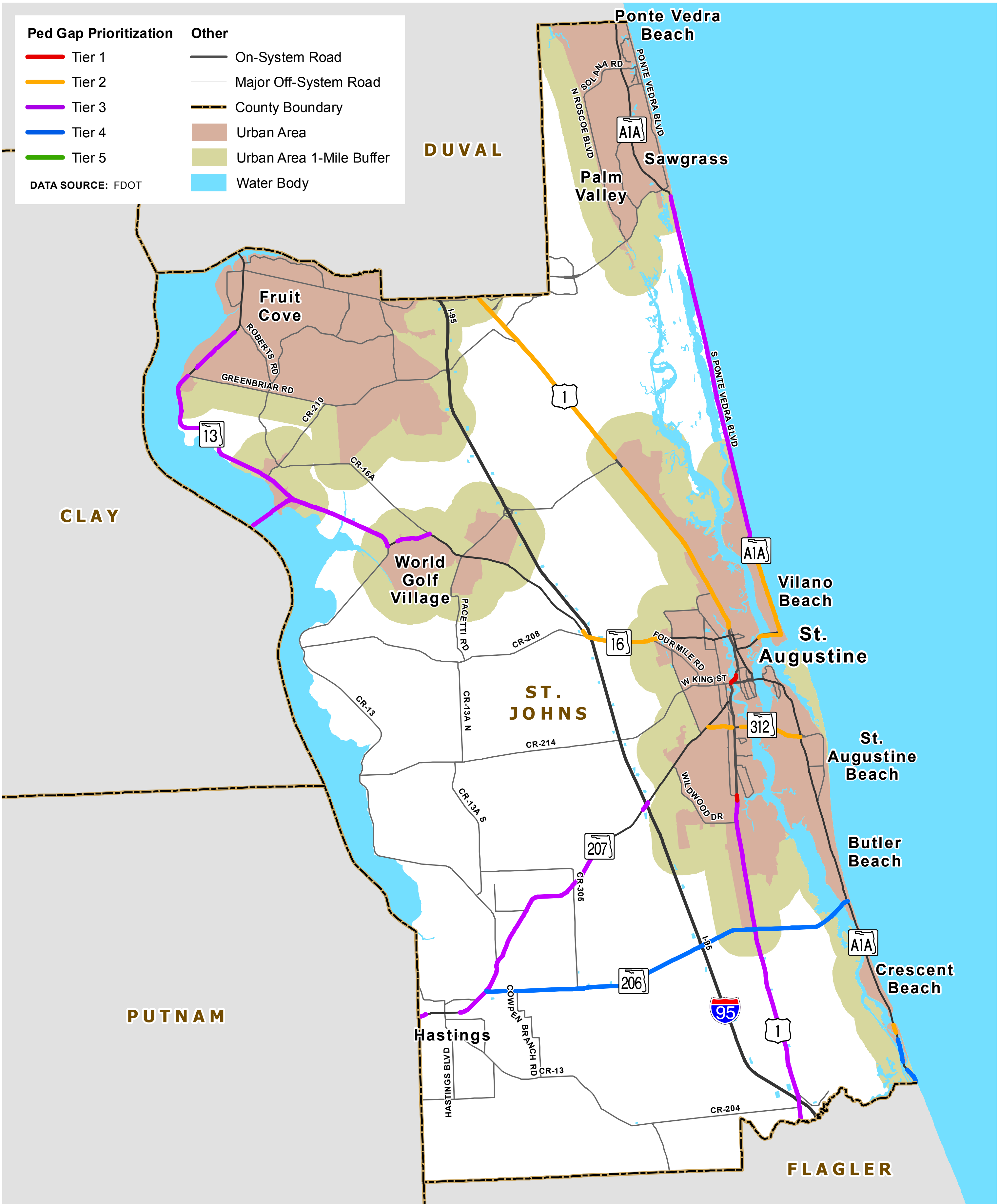

FDOT

# PEDESTRIAN GAP PRIORITIZATION

## PUTNAM COUNTY

FIGURE E2-14

FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY



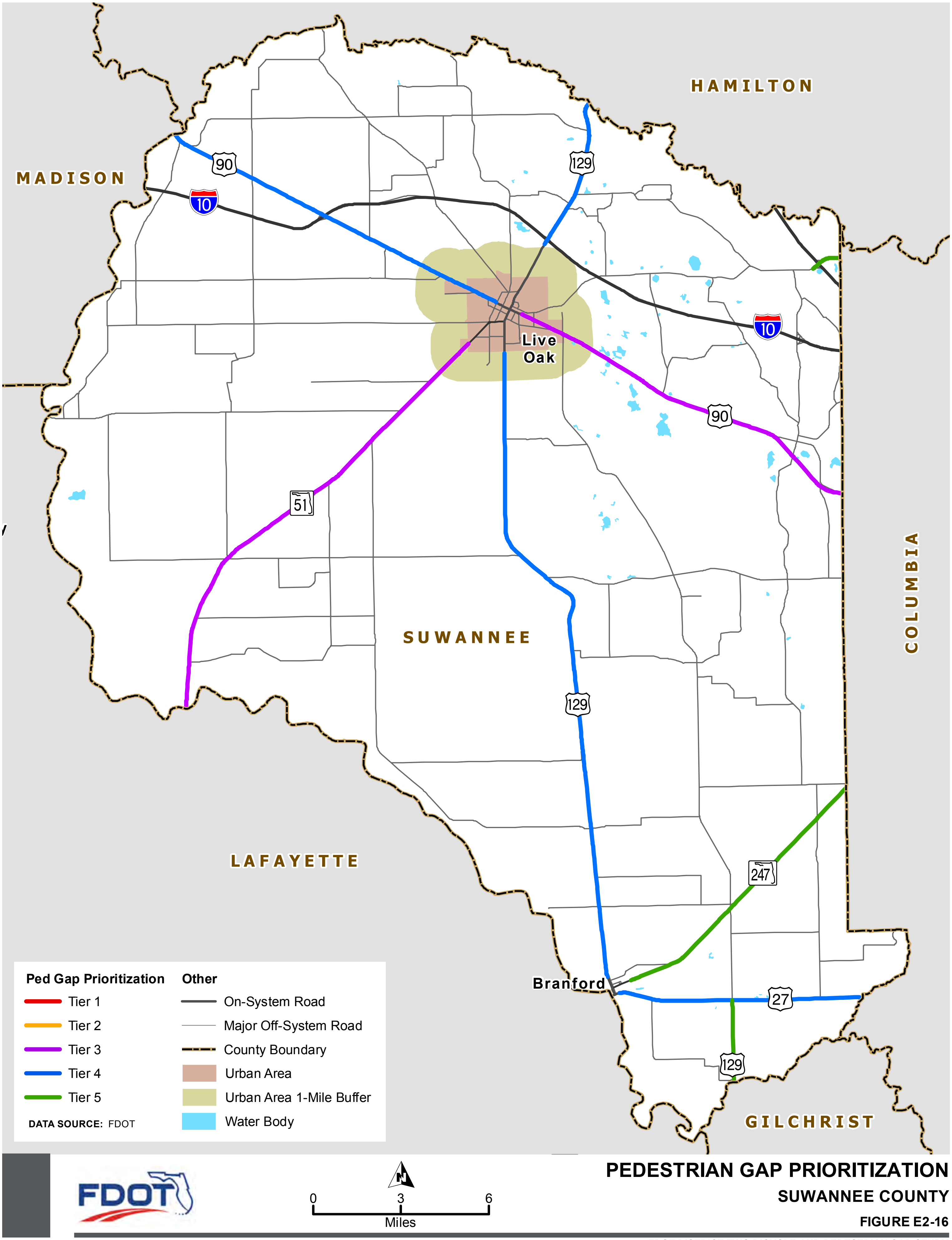

FDOT

# PEDESTRIAN GAP PRIORITIZATION

## ST. JOHNS COUNTY

FIGURE E2-15

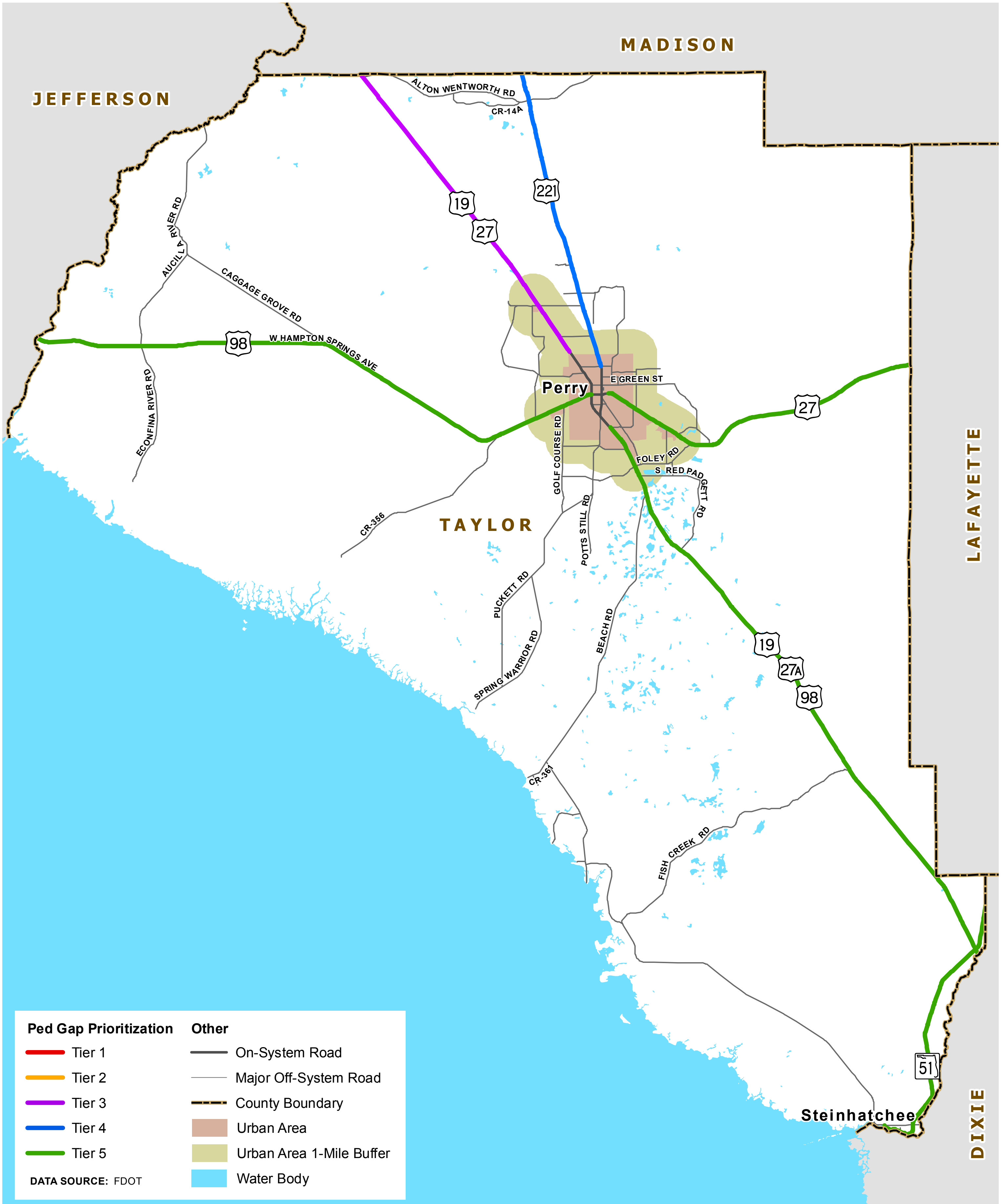
FDOT DISTRICT TWO BICYCLE AND PEDESTRIAN GAP STUDY




# PEDESTRIAN GAP PRIORITIZATION

## SUWANNEE COUNTY

FIGURE E2-16

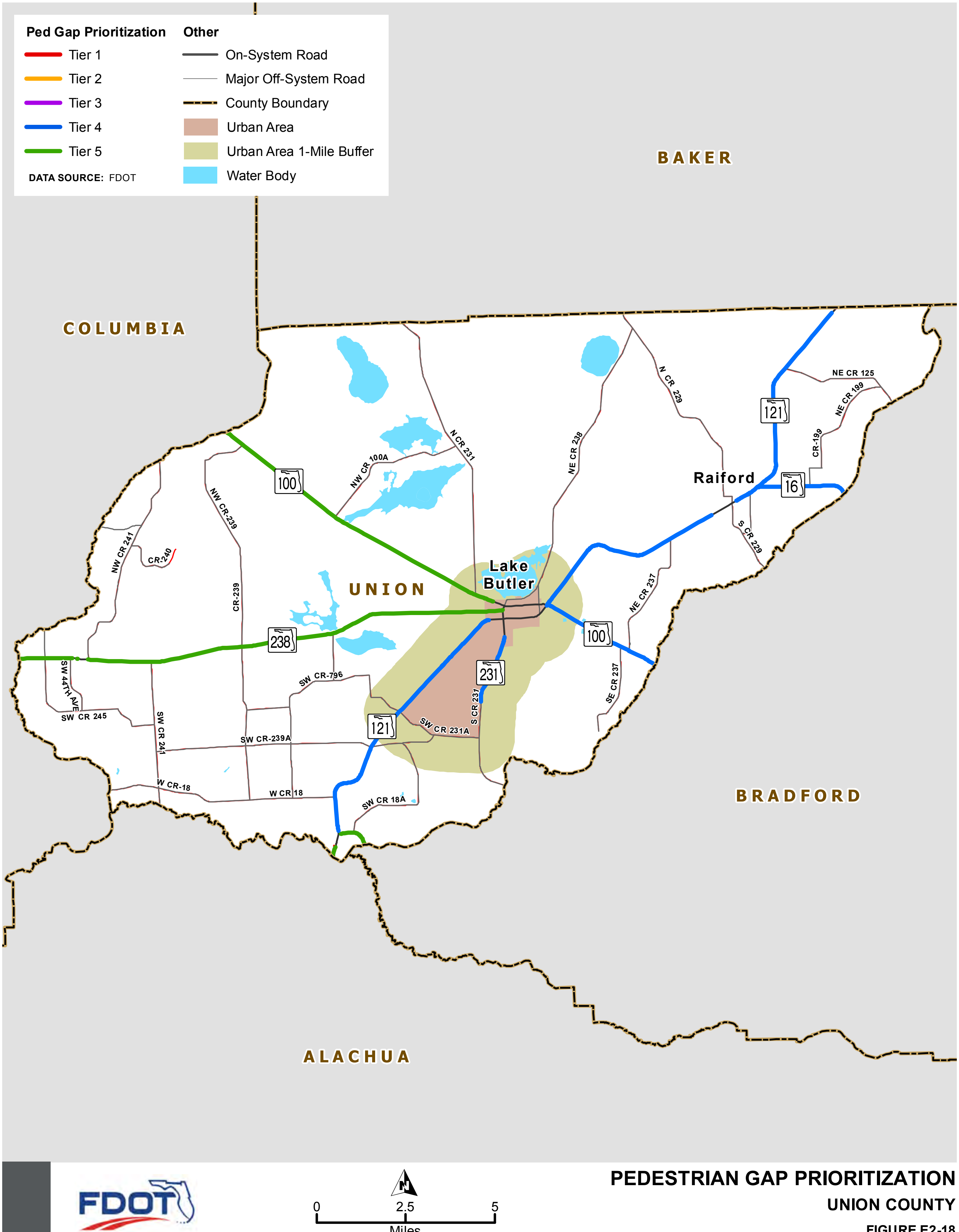



0 3.5 7
Miles

# PEDESTRIAN GAP PRIORITIZATION

## TAYLOR COUNTY

FIGURE E2-17




# PEDESTRIAN GAP PRIORITIZATION

## UNION COUNTY

**FIGURE E2-18**

**Ameera F. Sayeed, AICP, GISP**
District Growth and Development/Modeling Supervisor

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Derek.Dixon@dot.state.fl.us